

## WEST Search History

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DATE: Wednesday, July 06, 2005

<u>Hide?</u>	<u>Set Name</u>	<u>Query</u>	<u>Hit Count</u>
		<i>DB=PGPB; PLUR=YES; OP=AND</i>	
<input type="checkbox"/>	L1	(kwang or liu or low or loh).in. and salmonella	210
<input type="checkbox"/>	L2	L1 and enteritidis	13
<input type="checkbox"/>	L3	kwang.in. and enteritidis	0
		<i>DB=USPT; PLUR=YES; OP=AND</i>	
<input type="checkbox"/>	L4	kwang.in. and enteritidis	4
		<i>DB=PGPB,USPT; PLUR=YES; OP=AND</i>	
<input type="checkbox"/>	L5	(hweising or hwei-sing).in. and enteritidis	0
		<i>DB=EPAB,JPAB,DWPI; PLUR=YES; OP=AND</i>	
<input type="checkbox"/>	L6	(kwang or liu or low or loh).in. and salmonella	19
<input type="checkbox"/>	L7	L6 not l2	19
<input type="checkbox"/>	L8	L6 not l2	19
<input type="checkbox"/>	L9	(kwang).in. and salmonella	3

END OF SEARCH HISTORY

## WEST Search History





DATE: Wednesday, July 06, 2005

Hide?	Set Name	Query	Hit Count
		<i>DB=PGPB,USPT,USOC,EPAB,JPAB,DWPI,TDBD; PLUR=YES; OP=AND</i>	
<input type="checkbox"/>	L1	flagell\$ same enteritid\$	29
		<i>DB=EPAB,JPAB,DWPI; PLUR=YES; OP=AND</i>	
<input type="checkbox"/>	L2	9803656	9
		<i>DB=PGPB,USPT,USOC,EPAB,JPAB,DWPI,TDBD; PLUR=YES; OP=AND</i>	
<input type="checkbox"/>	L3	epitop\$ near10 flage\$	117
<input type="checkbox"/>	L4	L3 same salmonel\$	60
		<i>DB=USPT; PLUR=YES; OP=AND</i>	
<input type="checkbox"/>	L5	6211159.pn.	1
		<i>DB=PGPB,USPT,USOC,EPAB,JPAB,DWPI,TDBD; PLUR=YES; OP=AND</i>	
<input type="checkbox"/>	L6	salmonel\$.ti. and enteritid\$.ti. and (fimbria\$ or flagel\$)	4

END OF SEARCH HISTORY

Terms	Documents
salmonel\$.ti. and enteritid\$.ti. and (fimbria\$ or flagel\$)	4

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**Display Format:**

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## Search Results - Record(s) 1 through 29 of 29 returned.

- 
- ☐ 1. [20050068040](#). 26 Sep 03. 31 Mar 05. High efficiency electrostatic air sampler. Mitchell, Bailey W., et al. 324/457; G01R029/12.
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- ☐ 2. [20040120962](#). 15 Apr 03. 24 Jun 04. Modulation of immune responses to foreign antigens expressed by recombinant attenuated bacterial vectors. Curtiss, Roy III, et al. 424/184.1; A61K039/00 A61K039/38.
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- ☐ 3. [20040052802](#). 16 May 03. 18 Mar 04. Salmonella vaccine. Nuijten, Petrus Johannes Maria, et al. 424/184.1; A61K039/00 A61K039/38.
- 
- ☐ 4. [20040001849](#). 07 Mar 03. 01 Jan 04. Antigen library immunization. Punnonen, Juha, et al. 424/186.1; 424/188.1 424/189.1 424/190.1 530/350 A61K039/12 A61K039/21 A61K039/29 A61K039/02 C07K014/16 C07K014/02 C07K014/195.
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- ☐ 5. [20030228623](#). 27 Sep 02. 11 Dec 03. Methods for generating, selecting, and identifying compounds which bind a target molecule. Cantor, Charles R., et al. 435/7.1; 435/235.1 435/252.33 435/7.2 G01N033/53 G01N033/567 C12N007/00 C12N001/21.
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- ☐ 6. [20030219752](#). 17 May 02. 27 Nov 03. Novel antigen binding molecules for therapeutic, diagnostic, prophylactic, enzymatic, industrial, and agricultural applications, and methods for generating and screening thereof. Short, Jay M.. 435/6; 435/320.1 435/325 435/326 435/69.1 435/7.1 530/387.1 536/23.1 C12Q001/68 G01N033/53 C07H021/04 C12P021/02 C12N005/06 C07K016/00 C07H021/02 C12P021/06 C12N015/00 C12N015/09 C12N015/63 C12N015/70 C12N015/74 C12N005/00 C12N005/02 C12N005/06 C12N005/16.
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- ☐ 7. [20030219722](#). 22 Apr 02. 27 Nov 03. Fusion proteins, modified filamentous bacteriophage, and populations or libraries of same. Ladner, Robert Charles, et al. 435/5; 435/252.3 435/320.1 435/69.7 530/350 536/23.72 C07K014/01 C12Q001/70 C07H021/04 C12P021/04 C12N001/21 C12N015/74.
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- ☐ 8. [20030207287](#). 19 Aug 02. 06 Nov 03. Non-stochastic generation of genetic vaccines. Short, Jay M.. 435/6; 435/320.1 435/325 435/69.1 514/44 800/288 C12Q001/68 A61K048/00 A01H005/00 C12P021/02 C12N005/06 A61K031/70 A01N043/04 C12P021/06 A01H001/00 C12N015/82 C12N015/87 C12N015/00 C12N015/09 C12N015/63 C12N015/70 C12N015/74 C12N005/00 C12N005/02.
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- ☐ 9. [20030036181](#). 29 Jun 01. 20 Feb 03. Peptide extended glycosylated polypeptides. Okkels, Jens Sigurd, et al. 435/184; 435/183 530/322 530/350 530/351 530/388.1 530/397 C12N009/99 C12N009/00 C07K009/00 C07K016/46 C07K014/705 C07K014/575 C07K014/52 C07K014/475.
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- ☐ 10. [20020198162](#). 10 Feb 99. 26 Dec 02. ANTIGEN LIBRARY IMMUNIZATION. PUNNONEN, JUHA, et al. 514/44; A61K031/70 A01N043/04.
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- ☐ 11. [20020150881](#). 14 Feb 01. 17 Oct 02. Directed evolution of novel binding proteins. Ladner, Robert Charles, et al. 435/5; 435/235.1 435/6 435/7.1 C12Q001/70 C12Q001/68 G01N033/53 C12N007/00.
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12. [20020082206](#). 30 May 01. 27 Jun 02. Novel polynucleotides from atherogenic cells and polypeptides encoded thereby. Leach, Martin D., et al. 514/12; 435/183 435/320.1 435/325 435/69.1 530/350 536/23.1 A61K038/17 C07H021/04 C12N009/00 C12N005/06 C12P021/02 C07K014/435.
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13. [20010021386](#). 27 Dec 00. 13 Sep 01. Salmonella vaccine. Nuijten, Petrus Johannes Maria, et al. 424/258.1; 435/252.8 A61K039/112 C12N001/20.
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14. [6713279](#). 04 Feb 00; 30 Mar 04. Non-stochastic generation of genetic vaccines and enzymes. Short; Jay M.. 435/69.1; 435/320.1 435/334 435/6. C12P021/06 C12Q001/68 C12N005/06 C12N015/00.
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15. [6576757](#). 28 Nov 00; 10 Jun 03. Polynucleotides encoding flavivirus and alphavirus multivalent antigenic polypeptides. Punnonen; Juha, et al. 536/23.72; 424/184.1 424/204.1 424/218.1 424/228.1 536/23.1. C07H021/04 A61K039/12 A01N043/04.
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16. [6569435](#). 28 Nov 00; 27 May 03. Flavivirus and alphavirus recombinant antigen libraries. Punnonen; Juha, et al. 424/202.1; 424/204.1 424/234.1 424/236.1 424/274.1 435/320.1 435/6 514/44. A61K039/12 A61K039/295 A01N043/04.
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17. [6541011](#). 10 Feb 99; 01 Apr 03. Antigen library immunization. Punnonen; Juha, et al. 424/204.1; 424/218.1 530/300 530/350. A61K039/12 C07K001/00.
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18. [6479258](#). 31 Jan 00; 12 Nov 02. Non-stochastic generation of genetic vaccines. Short; Jay M.. 435/69.1; 530/350 536/23.2. C12P021/06 C07K001/00 C07H021/04.
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19. [5902742](#). 17 May 96; 11 May 99. Complex growth supplement for maintenance of bacterial cell viability and induction of bacterial cell differentiation. Petter; Jean Guard, et al. 435/252.1; 435/243 435/252.8 435/253.6. C12N001/20 C12N001/00.
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20. [5807694](#). 07 Sep 95; 15 Sep 98. Detection of salmonella enteritidis and other pathogenic microorganisms and monoclonal antibody useful therefor. Zawistowski; Jerzy. 435/7.35; 435/174 435/243 435/252.8 435/7.1 435/7.2 435/7.32. G01N033/569 G01N033/53 C12N001/20.
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22. [5674495](#). 27 Feb 95; 07 Oct 97. Alginate-based vaccine compositions. Bowersock; Terry L., et al. 424/184.1; 424/234.1 424/278.1 424/280.1 424/281.1 424/424 424/434 424/438 424/480 424/492. A61K039/00 A61K045/00 A61K039/02 A61F013/00.
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23. [5510241](#). 25 May 95; 23 Apr 96. Method of testing for the presence of Salmonella serotypes expressing Salmonella enteritidis fimbrial antigen (SEFA) and reagents therefore. Thorns; Christopher J.. 435/7.3; 435/7.35 530/350 530/387.1 530/388.4 530/389.5 530/391.1 530/391.3. G01N033/53 C07K014/255 C07K016/00.
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24. [WO2004055045A](#). Salmonella antigen formulation useful for identifying SE-infected fowl and fowl inoculated with SE-attenuated vaccine, comprising Salmonella enteritidis flagellin 9 kDa polypeptide. EKAWA, T, et al. A61K039/00 A61K039/112 A61P031/04 C07K014/255 G01N033/53 G01N033/569.
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- ☐ 25. [KR2002056452A](#). Egg yolk antibody against salmonella. KIM, J U. C07K016/02.
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- ☐ 27. [EP 1112747A](#). Bacterium of genus Salmonella, that in it's wild type form carries flagella, which is not capable of inducing antibodies against antigenic determinants of flagellin or flagella, useful for treating Salmonellosis. NUIJTEN, P J M, et al. A61K039/106 A61K039/112 A61K039/39 A61P001/12 A61P031/04 A61P037/04 C12N001/20 C12N001/21 C12N001/20 C12R001:42 C12N001/20 C12R001:42 C12N001/20 C12R001:42 C12N001/20 C12R001:42.
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- ☐ 28. [WO 200078995A](#). New method for the specific detection of Salmonella enteritidis infections of poultry comprises contacting a biological sample with antigenic fragments of S. enteritidis fimbrial and/or flagellin-proteins. KWANG, H, et al. C07K014/255 C12Q001/10.
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- ☐ 29. [WO 8604352A](#). Antisera prepn. capable of reacting with all salmonella - useful for analysis of food samples. FLEET, G H, et al. A61K039/40 C07K015/12 C12N011/14 G01N033/55.
- 

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Terms	Documents
flagell\$ same enteritid\$	29

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ile 155:MEDLINE(R) 1951-2005/Jul W1  
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Set	Items	Description
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Cost is in DialUnits

? ds

Terminal set to DLINK

? s (s1 or s2) and fusion? and flage? and (fimbr? or pili?)

Set	Items	Description
S1	4701	E3-E37
S2	4250	ENTERITIDIS?
S3	6815	'FIMBRIA' OR 'FIMBRIAE' OR E10-E12
S4	4964	R1:R7
S5	3890	R1-R2
S6	6624	E1-E23
S7	6622	R1-R2
S8	329	E3-E4
S9	325	'FLIC'
S10	26	(S1 OR S2) AND (S9 OR S3 OR S4 OR S5) AND (S6 OR S7 OR S8)
S11	13	S10/2000:2005
S12	13	S10 NOT S11

? s (s1 or s2) and fusion? and flage? and (fimbr? or pili?)

	4701	S1
	4250	S2
	126584	FUSION?
	11700	FLAGE?
	7919	FIMBR?
	3570	PILI?
S13	0	(S1 OR S2) AND FUSION? AND FLAGE? AND (FIMBR? OR PILI?)

?

? add medicine

06jul05 13:34:37 User228206 Session D2461.3  
\$1.19 0.350 DialUnits File155  
\$1.19 Estimated cost File155  
\$0.26 TELNET  
\$1.45 Estimated cost this search  
\$1.45 Estimated total session cost 0.350 DialUnits

SYSTEM:OS - DIALOG OneSearch

You have 26 files in your file list.

(To see file names, coverage dates, and copyright notices, enter SHOW FILES.)

Set	Items	Description
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Added File(s): 5, 34, 35, 48, 65, 71, 73, 91, 94, 98, 135, 144,  
149, 156, 159, 162, 164, 172, 266, 369, 370, 399, 434, 444,  
467

Previous sets have been retained; enter DISPLAY SETS to view them.

? s enteritidis? (100n) fusion? (100n) flage? (100n) (fimbri? or pili?)

	26558	ENTERITIDIS?
	916273	FUSION?
	152912	FLAGE?
	41115	FIMBRI?
	34154	PILI?
S14	1	ENTERITIDIS? (100N) FUSION? (100N) FLAGE? (100N) (FIMBRI? OR PILI?)

? t sl4/6/all

14/6/1 (Item 1 from file: 399)

DIALOG(R)File 399:(c) 2005 American Chemical Society. All rts. reserv.

Detection of Salmonella enteritidis by detecting antibodies to fimbrial or flagellin proteins

? t sl4/3,kwic/all

>>>KWIC option is not available in file(s): 399

14/3,KWIC/1 (Item 1 from file: 399)

DIALOG(R)File 399:CA SEARCH(R)

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134070354 CA: 134(6)70354c PATENT

Detection of Salmonella enteritidis by detecting antibodies to fimbrial or flagellin proteins

INVENTOR(AUTHOR): Kwang, Hwei-Sing; Liu, Wei; Low, Su-Shing Sharon; Loh, Kwang Yeng Hilda

LOCATION: Singapore,

ASSIGNEE: Institute of Molecular Agrobiolgy

PATENT: PCT International ; WO 200078995 A1 DATE: 20001228

APPLICATION: WO 99SG61 (19990622)

PAGES: 48 pp. CODEN: PIXXD2 LANGUAGE: English CLASS: C12Q-001/10A; C07K-014/255B DESIGNATED COUNTRIES: AE; AL; AM; AT; AU; AZ; BA; BB; BG; BR; BY; CA; CH; CN; CU; CZ; DE; DK; EE; ES; FI; GB; GD; GE; GH; GM; HR; HU; ID; IL; IN; IS; JP; KE; KG; KP; KR; KZ; LC; LK; LR; LS; LT; LU; LV; MD; MG; MK; MN; MW; MX; NO; NZ; PL; PT; RO; RU; SD; SE; SG; SI; SK; SL; TJ; TM; TR; TT; UA; UG; US; UZ; VN; YU; ZA; ZW; AM; AZ; BY; KG; KZ; MD; RU; TJ; TM

DESIGNATED REGIONAL: GH; GM; KE; LS; MW; SD; SL; SZ; UG; ZW; AT; BE; CH; CY; DE; DK; ES; FI; FR; GB; GR; IE; IT; LU; MC; NL; PT; SE; BF; BJ; CF; CG; CI; CM; GA; GN; GW; ML; MR; NE; SN; TD; TG

? logoff hold

06jul05 13:35:57 User228206 Session D2461.4

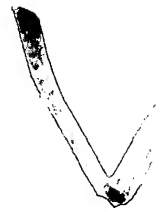
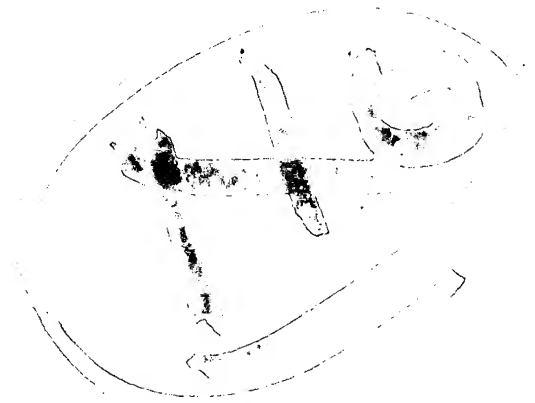
\$0.15	0.043	DialUnits	File155
\$0.15		Estimated cost	File155
\$0.66	0.111	DialUnits	File5
\$0.66		Estimated cost	File5
\$1.57	0.071	DialUnits	File34
\$1.57		Estimated cost	File34
\$0.11	0.028	DialUnits	File35
\$0.11		Estimated cost	File35
\$0.08	0.015	DialUnits	File48
\$0.08		Estimated cost	File48
\$0.10	0.028	DialUnits	File65
\$0.10		Estimated cost	File65
\$0.38	0.043	DialUnits	File71
\$0.38		Estimated cost	File71
\$0.59	0.056	DialUnits	File73
\$0.59		Estimated cost	File73
\$0.09	0.022	DialUnits	File91
\$0.09		Estimated cost	File91
\$0.12	0.034	DialUnits	File94
\$0.12		Estimated cost	File94
\$0.13	0.031	DialUnits	File98
\$0.13		Estimated cost	File98
\$0.12	0.022	DialUnits	File135
\$0.12		Estimated cost	File135
\$0.32	0.071	DialUnits	File144

\$0.32	Estimated cost	File144	
	\$0.11	0.025 DialUnits	File149
\$0.11	Estimated cost	File149	
	\$0.22	0.037 DialUnits	File156
\$0.22	Estimated cost	File156	
	\$0.12	0.037 DialUnits	File159
\$0.12	Estimated cost	File159	
	\$0.11	0.025 DialUnits	File162
\$0.11	Estimated cost	File162	
	\$0.05	0.015 DialUnits	File164
\$0.05	Estimated cost	File164	
	\$0.20	0.019 DialUnits	File172
\$0.20	Estimated cost	File172	
	\$0.08	0.022 DialUnits	File266
\$0.08	Estimated cost	File266	
	\$0.04	0.012 DialUnits	File369
\$0.04	Estimated cost	File369	
	\$0.08	0.022 DialUnits	File370
\$0.08	Estimated cost	File370	
	\$1.36	0.108 DialUnits	File399
	\$2.75	1 Type(s) in Format	3
	\$0.55	1 Type(s) in Format	6
	\$3.30	2 Types	
\$4.66	Estimated cost	File399	
	\$0.62	0.028 DialUnits	File434
\$0.62	Estimated cost	File434	
	\$0.12	0.025 DialUnits	File444
\$0.12	Estimated cost	File444	
	\$0.10	0.015 DialUnits	File467
\$0.10	Estimated cost	File467	
	OneSearch, 26 files,	0.965 DialUnits	FileOS
\$0.53	TELNET		
\$11.46	Estimated cost this search		
\$12.91	Estimated total session cost	1.315 DialUnits	

Logoff: level 05.05.00 D 13:35:57

You are now logged off

flagellar (G) antigens observed on *Salmonella enteritidis* and *S. pullorum* (Holt and Chaubal (1997) J. Clin. Microbiol. 35: 1016-1020);



11968553 PMID: 9252570

**SEF17 fimbriae are essential for the convoluted colonial morphology of *Salmonella enteritidis*.**

Allen-Vercoe E; Dibb-Fuller M; Thorns C J; Woodward M J

Department of Bacteriology, Central Veterinary Laboratory, Addlestone, Surrey, UK.

FEMS microbiology letters (NETHERLANDS) Aug 1 1997, 153 (1) p33-42, ISSN 0378-1097 Journal Code: 7705721

Publishing Model Print

Document type: Journal Article

Languages: ENGLISH

Main Citation Owner: NLM

Record type: MEDLINE; Completed

Subfile: INDEX MEDICUS

*Salmonella enteritidis* isolated from poultry infections generated a convoluted colonial morphology after 48 h growth on colonisation factor antigen (CFA) agar at 25 degrees C. A mutant *S. enteritidis* defective for the elaboration of the SEF17 fimbrial antigen, in which the agf gene cluster was inactivated by insertion of an ampicillin resistance gene cassette, and other wild-type *S. enteritidis* transduced to this genotype failed to produce convoluted colonies. However, growth of SEF17- mutants at 25 degrees C on CFA agar supplemented with 0.001% Congo red resulted in partial recovery of the phenotype. Immunoelectron microscopy demonstrated that copious amounts of the SEF17 fimbrial antigen were present in the extracellular matrix of convoluted colonies of wild-type virulent *S. enteritidis* isolates. Bacteria were often hyperflagellated also. Immunoelectron microscopy of SEF17- mutants grown on CFA agar+0.001% Congo red demonstrated the elaboration of an as yet undefined fimbrial structure. Isolates of *S. enteritidis* which were described previously as avirulent and sensitive to environmental stress failed to express SEF17 or produce convoluted colonies. These data indicate an essential role for SEF17, and possibly for another **fimbria** and **flagella**, in the generation of the convoluted colonial phenotype. The relationship between virulence and colonial phenotype is discussed.

Tags: Research Support, Non-U.S. Gov't

Descriptors: **\*Fim**

6/9/32 (Item 32 from file: 155)  
DIALOG(R) File 155:MEDLINE(R)  
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10138340 PMID: 8468257

**Alternative antigens reduce cross-reactions in an ELISA for the detection of Salmonella enteritidis in poultry.**

Baay M F; Huis in 't Veld J H

Department of the Science of Food of Animal Origin, Faculty of Veterinary Medicine, University of Utrecht, The Netherlands.

Journal of applied bacteriology (ENGLAND) Mar 1993, 74 (3) p243-7,  
ISSN 0021-8847 Journal Code: 7503050

Publishing Model Print

Document type: Journal Article

Languages: ENGLISH

Main Citation Owner: NLM

Record type: MEDLINE; Completed

Subfile: INDEX MEDICUS

Two alternative antigens for the use in detection of **antibodies** to salmonellas were investigated: firstly, lipopolysaccharide (LPS) from members of the D2 group, having antigens O: 9, 46, and **flagella** antigens. Whereas LPS from the D2 group did not discriminate sufficiently with control sera, **flagella** antigens reacted specifically with **antibodies** directed to serotype specific H antigens. When **flagella** antigens were used to screen sera from birds of commercial flocks, however, cross-reactivity between **flagella** antigens was observed. When both LPS and **flagella** antigens were used to screen sera from chickens infected with *Salmonella enteritidis*, the sera gave higher titres with **flagella** antigens during the early stages of infection, and titres with **flagella** antigens dropped earlier after infection had ended than titres with lipopolysaccharide.

Tags: Research Support, Non-U.S. Gov't

Descriptors: \*Antigens, Bacterial--immunology--IM; \*Enzyme-Linked Immunosorbent Assay--methods--MT; \*Poultry Diseases--microbiology--MI; \*Salmonella Infections, Animal--microbiology--MI; \*Salmonella enteritidis --isolation and purification--IP; Animals; **Antibodies**, Bacterial--blood --BL; Chickens; Cross Reactions; Feces--microbiology--MI; **Flagella** --immunology--IM; **Immune** Sera--immunology--IM; Lipopolysaccharides --immunology--IM; Poultry Diseases--immunology--IM; Salmonella Infections, Animal--immunology--IM; Salmonella **enteritidis** --immunology--IM

CAS Registry No.: 0 (Antibodies, Bacterial); 0 (Antigens, Bacterial); 0 (Immune Sera); 0 (Lipopolysaccharides)

Record Date Created: 19930507

Record Date Completed: 19930507

6/9/33 (Item 33 from file: 155)  
DIALOG(R) File 155:MEDLINE(R)  
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10016532 PMID: 1361237

**Characterisation of monoclonal antibodies against a fimbrial structure of Salmonella enteritidis and certain other serogroup D salmonellae and their application as serotyping reagents.**

Thorns C J; Sojka M G; McLaren I M; Dibb-Fuller M

Ministry of Agriculture, Fisheries and Food, Central Veterinary Laboratory, Weybridge, Surrey.

Research in veterinary science (ENGLAND) Nov 1992, 53 (3) p300-8,

ISSN 0034-5288 Journal Code: 0401300

Publishing Model Print

Document type: Journal Article

Languages: ENGLISH

Main Citation Owner: NLM

Record type: MEDLINE; Completed

Subfile: INDEX MEDICUS

A panel of 13 monoclonal **antibodies** from different hybridomas was produced against a novel salmonella **fimbrial** antigen expressed predominantly by Salmonella **enteritidis** strains. The specificity of the monoclonal **antibodies** to this antigen (SEF14) was confirmed by enzyme-linked immunosorbent assay (ELISA) using purified SEF14, **immune** electron microscopy and, with 11 monoclonal **antibodies**, the identification of a repeating protein subunit (14,300kDa) on the antigen. Blocking-ELISA with the monoclonal **antibodies** identified epitopes in at least three, non-overlapping clusters which appeared evenly distributed on SEF14 in **immune** electron microscopy. The use of the monoclonal **antibodies** in direct-binding ELISA on a range of salmonella serotypes suggested that the epitopes on SEF14 are highly conserved and were expressed by all the S **enteritidis** strains examined; some strains of S dublin and the only strain of S moscow available were the only other serotypes that expressed SEF14. A latex agglutination reagent based on a monoclonal **antibody** was developed and used to test for SEF14 on 280 strains (representing 120 serotypes in 24 serogroups of salmonellae) that had been grown on Sensitest agar for 18 hours at 37 degrees C. All S **enteritidis** strains (64) and most S dublin strains (28 of 33) produced SEF14 as did the two strains representing S blegdam and S moscow. SEF14 was not detected in any other strains of serotypes from serogroup D or from any other serogroup examined.

Descriptors: \*Antigens, Bacterial--immunology--IM; \*Fimbriae, Bacterial--immunology--IM; \*Salmonella--immunology--IM; \*Salmonella enteritidis--immunology--IM; \*Serotyping--methods--MT; Antibodies, Bacterial; Antibodies, Monoclonal; Enzyme-Linked Immunosorbent Assay; Indicators and Reagents; Latex Fixation Tests; Microscopy, Immunoelectron; Salmonella--classification--CL; Sensitivity and Specificity

CAS Registry No.: 0 (Antibodies, Bacterial); 0 (Antibodies, Monoclonal); 0 (Antigens, Bacterial); 0 (Indicators and Reagents)

Record Date Created: 19930121

Record Date Completed: 19930121

6/9/34 (Item 34 from file: 155)

DIALOG(R) File 155:MEDLINE(R)

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09932065 PMID: 1400954

Comparison of four different enzyme-linked immunosorbent assays for serological diagnosis of Salmonella enteritidis infections in experimentally infected chickens.

van Zijderveld F G; van Zijderveld-van Bommel A M; Anakotta J

Department of Bacteriology, DLO-Central Veterinary Institute, Lelystad, The Netherlands.

Journal of clinical microbiology (UNITED STATES) Oct 1992, 30 (10) p2560-6, ISSN 0095-1137 Journal Code: 7505564

Publishing Model Print

Document type: Journal Article

Languages: ENGLISH

Main Citation Owner: NLM

Record type: MEDLINE; Completed

Subfile: INDEX MEDICUS

The program for the eradication of *Salmonella enteritidis* from chickens in The Netherlands is based on bacteriological examination of breeding flocks. There is a great need for a specific and sensitive serological screening test. For that purpose, we developed four different enzyme-linked immunosorbent assays (ELISAs), i.e., an indirect ELISA with *S. enteritidis* flagellin, an indirect ELISA with *S. enteritidis* lipopolysaccharide, a double-antibody sandwich blocking ELISA that uses monoclonal antibodies against *S. enteritidis* flagellin (GM-DAS blocking ELISA), and a double-antibody sandwich ELISA that uses monoclonal antibodies against *S. enteritidis* lipopolysaccharide. In the present study, we compare the results of those ELISAs with sera from experimentally infected 1-day-old chickens and with sera and eggs from experimentally infected laying hens. Experimental infections were induced with strains of *S. enteritidis* phage types 1 and 2, *S. typhimurium*, and *S. panama*. Sera were collected up to days 44 and 39 after infection from 1-day-old chickens and laying hens, respectively. Only the GM-DAS blocking ELISA was able to discriminate between *S. enteritidis* infections and infections with the other serotypes. This ELISA had both a sensitivity and a specificity of 100% for all serum samples from experimentally infected chickens. A field study is in progress to evaluate whether this test can be implemented in the Dutch *S. enteritidis* eradication program.

Tags: Comparative Study

Descriptors: \*Antibodies, Bacterial--blood--BL; \*Chickens--microbiology--MI; \*Enzyme-Linked Immunosorbent Assay--veterinary--VE; \*Poultry Diseases--diagnosis--DI; \*Salmonella Infections, Animal--diagnosis--DI; \*Salmonella enteritidis--isolation and purification--IP; Animals; Antibodies, Monoclonal; Egg Yolk--immunology--IM; Enzyme-Linked Immunosorbent Assay--methods--MT; Flagellin--immunology--IM; Lipopolysaccharides--immunology--IM; Salmonella enteritidis--immunology--IM; Sensitivity and Specificity; Serologic Tests--methods--MT

CAS Registry No.: 0 (Antibodies, Bacterial); 0 (Antibodies, Monoclonal); 0 (Lipopolysaccharides); 12777-81-0 (Flagellin)

Record Date Created: 19921110

Record Date Completed: 19921110

6/9/37 (Item 37 from file: 155)

DIALOG(R) File 155:MEDLINE(R)

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09461322 PMID: 1677357

Purification and characterization of thin, aggregative fimbriae from *Salmonella enteritidis*.

Collinson S K; Emody L; Muller K H; Trust T J; Kay W W  
Department of Biochemistry and Microbiology, University of Victoria,  
British Columbia, Canada.

Journal of bacteriology (UNITED STATES) Aug 1991, 173 (15) p4773-81,  
ISSN 0021-9193 Journal Code: 2985120R

Publishing Model Print

Document type: Journal Article

Languages: ENGLISH

Main Citation Owner: NLM

Record type: MEDLINE; Completed

Subfile: INDEX MEDICUS

Novel fimbriae were isolated and purified from the human enteropathogen *Salmonella enteritidis* 27655. These fimbriae were thin (measuring 3 to

4 nm in diameter), were extremely aggregative, and remained cell associated despite attempts to separate them from blended cells by centrifugation. The thin **fimbriae** were not solubilized in 5 M NaOH or in boiling 0.5% deoxycholate, 8 M urea, or 1 to 2% sodium dodecyl sulfate (SDS) with or without 5% beta-mercaptoethanol. Therefore, an unconventional purification procedure based on the removal of contaminating cell macromolecules in sonicated cell extracts by enzymatic digestion and preparative SDS-polyacrylamide gel electrophoresis (PAGE) was used. The insoluble **fimbriae** recovered from the well of the gel required depolymerization in formic acid prior to analysis by SDS-PAGE. Acid depolymerization revealed that the **fimbriae** were composed of fimbrin subunits, each with an apparent molecular mass of 17 kDa. Although their biochemical characteristics and amino acid composition were typical of **fimbriae** in general, these thin **fimbriae** were clearly distinct from other previously characterized **fimbriae**. Moreover, their fimbrin subunits had a unique N-terminal amino acid sequence. Native **fimbriae** on whole cells were specifically labeled with immune serum raised to the purified **fimbriae**. This immune serum also reacted with the denatured 17-kDa fimbrin protein in Western blots. The polyclonal immune serum did not cross-react with the other two native **fimbrial** types produced by this strain or with their respective fimbrins on Western blots (immunoblots). Therefore, these **fimbriae** represent the third **fimbrial** type produced by the enteropathogen *S. enteritidis*.

Tags: Research Support, Non-U.S. Gov't

Descriptors: \*Bacterial Adhesion; \*Fimbriae, Bacterial--ultrastructure--UL; \*Salmonella enteritidis--ultrastructure--UL; Amino Acid Sequence; Electrophoresis, Polyacrylamide Gel; Fimbriae, Bacterial--physiology--PH; Humans; Immunohistochemistry; Isoelectric Focusing; Molecular Sequence Data; Molecular Weight; Salmonella enteritidis--pathogenicity--PY

Record Date Created: 19910829

Record Date Completed: 19910829

6/9/38 (Item 38 from file: 155)

DIALOG(R) File 155:MEDLINE(R)

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09461321 PMID: 1677356

**Type 1 fimbriae of Salmonella enteritidis.**

Muller K H; Collinson S K; Trust T J; Kay W W

Department of Biochemistry and Microbiology, University of Victoria, British Columbia, Canada.

Journal of bacteriology (UNITED STATES) Aug 1991, 173 (15) p4765-72, ISSN 0021-9193 Journal Code: 2985120R

Publishing Model Print

Document type: Journal Article

Languages: ENGLISH

Main Citation Owner: NLM

Record type: MEDLINE; Completed

Subfile: INDEX MEDICUS

*Salmonella enteritidis* was previously shown to produce **fimbriae** composed of 14,000-molecular-weight (Mr) fimbrin monomers (J. Feutrier, W. Kay, and T. J. Trust, J. Bacteriol. 168:221-227, 1986). Another distinct **fimbrial** structure, comprising 21,000-Mr fimbrin monomers, has now been identified. These **fimbriae** are simply designated as SEF 14 and SEF 21, respectively (for *S. enteritidis* **fimbriae** and the Mr [in thousands] of the fimbrin monomer). A simple method for the purification of both structures was developed by using the different biochemical properties of

these **fimbriae** . SEF 21 remained intact after being boiled in sodium dodecyl sulfate but readily dissociated into subunits of 21,000 Mr at pH 2.2. The overall amino acid composition and the N-terminal amino acid sequence of the SEF 21 fimbrin were distinct from those of SEF 14 but were virtually identical to the predicted sequence for type 1 fimbrin of *Salmonella typhimurium*. Immunoelectron microscopy of *S. enteritidis* clearly revealed **fimbrial** structures that reacted with **immune** serum specific to the 21,000-Mr fimbrin. **Immune** sera raised against this subunit were cross-reactive with type 1 fimbrins found in whole-cell lysates of *S. typhimurium*, *Salmonella illinois*, and *Salmonella cubana*. However, there was no cross-reaction with *Escherichia coli* type 1 **fimbriae** or with other fimbrins produced by *S. enteritidis* . Under certain growth conditions, *S. enteritidis* produced both SEF 14 and SEF 21. However, when *S. enteritidis* was grown at 30 degrees C or lower, only the 21,000-Mr SEF 21 fimbrin could be detected. There was a direct correlation between mannose-sensitive hemagglutination and the presence of SEF 21.

Tags: Research Support, Non-U.S. Gov't

Descriptors: \***Fimbriae**, Bacterial--ultrastructure--UL; \***Microfilament Proteins**; \***Salmonella enteritidis**--ultrastructure--UL; Amino Acid Sequence; Cross Reactions; **Fimbriae** , Bacterial--chemistry--CH; **Fimbriae** , Bacterial--immunology--IM; Hemagglutination Tests; **Immune** Sera; Membrane Glycoproteins--chemistry--CH; Molecular Sequence Data; Molecular Weight; *Salmonella enteritidis* --classification--CL; *Salmonella enteritidis* --immunology--IM

CAS Registry No.: 0 (Immune Sera); 0 (Membrane Glycoproteins); 0 (Microfilament Proteins); 0 (fimbrin)

Record Date Created: 19910829

Record Date Completed: 19910829

6/9/41 (Item 41 from file: 155)

DIALOG(R) File 155:MEDLINE(R)

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09137583 PMID: 2219649

Detection of antibody to *Salmonella enteritidis* by a gm flagellin-based ELISA.

Timoney J F; Sikora N; Shivaprasad H L; Opitz M

Department of Veterinary Microbiology, Immunology and Parasitology, New York State College of Veterinary Medicine, Cornell University, Ithaca 14853.

Veterinary record (ENGLAND) Aug 18 1990, 127 (7) p168-9, ISSN 0042-4900 Journal Code: 0031164

Publishing Model Print

Document type: Journal Article

Languages: ENGLISH

Main Citation Owner: NLM

Record type: MEDLINE; Completed

Subfile: INDEX MEDICUS

Descriptors: \***Antibodies** , Bacterial--blood--BL; \***Enzyme-Linked Immunosorbent Assay**--veterinary--VE; \* **Flagellin** --immunology--IM; \***Salmonella enteritidis** --immunology--IM; Animals; Chickens; Enzyme-Linked Immunosorbent Assay--methods--MT; Immunoblotting--veterinary--VE; Immunoenzyme Techniques--veterinary--VE; Poultry Diseases--diagnosis--DI; *Salmonella* Infections, Animal--diagnosis--DI

CAS Registry No.: 0 (Antibodies, Bacterial); 12777-81-0 (Flagellin)

Record Date Created: 19901121

Record Date Completed: 19901121

6/9/45 (Item 45 from file: 155)

DIALOG(R) File 155:MEDLINE(R)

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08342418 PMID: 2900832

**Cloning and expression of a Salmonella enteritidis fimbrin gene in Escherichia coli.**

Feutrier J; Kay W W; Trust T J

Department of Biochemistry and Microbiology, University of Victoria, British Columbia, Canada.

Journal of bacteriology (UNITED STATES) Sep 1988, 170 (9) p4216-22, ISSN 0021-9193 Journal Code: 2985120R

Publishing Model Print

Document type: Journal Article

Languages: ENGLISH

Main Citation Owner: NLM

Record type: MEDLINE; Completed

Subfile: INDEX MEDICUS

A gene bank of DNA from a human isolate of *Salmonella enteritidis* was constructed in the cosmid pH79 in *Escherichia coli* HB101. Five clones containing 35- to 45-kilobase inserts of *S. enteritidis* DNA reacted in colony immunoblot assays with a polyclonal antiserum prepared against purified *S. enteritidis fimbriae*. Electron microscopy showed that none of the five fimbrin-producing clones produced *fimbriae*, yet radioimmunoprecipitation and sodium dodecyl sulfate-polyacrylamide gel electrophoresis located the 14,400-molecular-weight *S. enteritidis* in the outer membrane fraction of three of the clones and in the periplasmic fraction of all five clones. By using an oligonucleotide probe homologous to the 5' region of the fimbrin structural gene, the fimbrin gene was located on a 5.3-kilobase HindIII fragment. In vitro transcription-translation analysis verified that this HindIII fragment subcloned into plasmid pTZ18R produced unprocessed *S. enteritidis* fimbrin of molecular weight 16,400. Dot blot hybridization against a selection of strains of the family Enterobacteriaceae indicated a limited distribution of the *S. enteritidis* fimbrin gene.

Tags: Research Support, Non-U.S. Gov't

Descriptors: \**Escherichia coli*--genetics--GE; \**Fimbriae*, Bacterial--physiology--PH; \*Membrane Glycoproteins--genetics--GE; \*Microfilament Proteins; \**Salmonella enteritidis*--genetics--GE; Autoradiography; Cloning, Molecular; Cosmids; DNA Restriction Enzymes; DNA, Bacterial--genetics--GE; Electrophoresis, Polyacrylamide Gel; Gene Expression Regulation; Genes, Bacterial; Genes, Structural; Humans; Immunoassay; Membrane Glycoproteins--analysis--AN; Nucleic Acid Hybridization; *Salmonella enteritidis*--analysis--AN; *Salmonella enteritidis*--ultrastructure--UL

CAS Registry No.: 0 (Cosmids); 0 (DNA, Bacterial); 0 (Membrane Glycoproteins); 0 (Microfilament Proteins); 0 (fimbrin)

Enzyme No.: EC 3.1.21 (DNA Restriction Enzymes)

Record Date Created: 19881006

Record Date Completed: 19881006

6/9/46 (Item 46 from file: 155)

DIALOG(R) File 155:MEDLINE(R)

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07677458 PMID: 2875990

**Purification and characterization of fimbriae from Salmonella enteritidis.**

Feutrier J; Kay W W; Trust T J

Journal of bacteriology (UNITED STATES) Oct 1986, 168 (1) p221-7,  
ISSN 0021-9193 Journal Code: 2985120R

Publishing Model Print

Document type: Journal Article

Languages: ENGLISH

Main Citation Owner: NLM

Record type: MEDLINE; Completed

Subfile: INDEX MEDICUS

A human isolate of *Salmonella enteritidis* which displayed strong pellicle formation during static broth culture and mannose-sensitive hemagglutination produced **fimbriae** which were morphologically indistinguishable from type 1 **fimbriae** of members of the family Enterobacteriaceae. Fimbrin was purified to homogeneity, and the apparent molecular weight (Mr, 14,400) was markedly lower than that reported for the type 1 fimbrin of *Salmonella typhimurium* (Mr, 22,100). This fimbrin contained 40% hydrophobic amino acids and lacked cysteine. The sequence of the N-terminal 64 amino acids was determined, and sequence alignment revealed that although the 18 N-terminal residues of the *S. enteritidis* molecule shared considerable homology with *Escherichia coli* and *S. typhimurium* type 1 fimbrins, the *S. enteritidis* fimbrin lacked a 6- to 9-residue terminal sequence present in the other type 1 fimbrins and, after residue 18, shared little homology with the *E. coli* sequence. **Antibodies** raised to the purified *S. enteritidis* fimbrin bound to surface-exposed conformational epitopes on the native **fimbriae** and displayed pronounced serospecificity. These **antibodies** were used in the isolation of a nonfimbriated Tn10 insertion mutant which was unable to hemagglutinate.

Tags: Research Support, Non-U.S. Gov't

Descriptors: \*Bacterial Proteins--analysis--AN; \*Fimbriae, Bacterial --analysis--AN; \*Membrane Glycoproteins; \*Membrane Proteins--analysis--AN; \*Microfilament Proteins; \*Salmonella enteritidis--ultrastructure--UL; Amino Acid Sequence; Antigens, Bacterial--immunology--IM; Bacterial Proteins --genetics--GE; Bacterial Proteins--immunology--IM; Bacterial Proteins --isolation and purification--IP; Cell Fractionation; DNA Transposable Elements; Hemagglutination; Membrane Proteins--genetics--GE; Membrane Proteins--immunology--IM; Membrane Proteins--isolation and purification --IP; Molecular Weight; Mutation; Salmonella enteritidis--analysis--AN; Salmonella enteritidis--genetics--GE

CAS Registry No.: 0 (Antigens, Bacterial); 0 (Bacterial Proteins); 0 (DNA Transposable Elements); 0 (Membrane Glycoproteins); 0 (Membrane Proteins); 0 (Microfilament Proteins); 0 (fimbrin)

Record Date Created: 19861110

Record Date Completed: 19861110

6/9/2 (Item 2 from file: 155)

DIALOG(R) File 155:MEDLINE(R)

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12438093 PMID: 9748652

**Periplasmic and fimbrial SefA from Salmonella enteritidis.**

Clouthier S C; Collinson S K; Lippert D; Ausio J; White A P; Kay W W

Department of Biochemistry and Microbiology, Petch Building, University of Victoria, P.O. Box 3055, Victoria, B.C. V8W 3P6, Canada.

Biochimica et biophysica acta (NETHERLANDS) Sep 8 1998, 1387 (1-2) p355-68, ISSN 0006-3002 Journal Code: 0217513

Publishing Model Print

Document type: Journal Article

Languages: ENGLISH

Main Citation Owner: NLM

Record type: MEDLINE; Completed

Subfile: INDEX MEDICUS

*Salmonella enteritidis* produces thin, filamentous **fimbriae** composed of the fimbriin subunit SefA. Although insoluble in most detergents and chaotropic agents, these **fimbriae** were soluble at pH 10.5. Furthermore, in sodium dodecyl sulfate, these fibers depolymerized into monomers, dimers and other multimers of SefA, which precipitated on removal of the detergent. In contrast, unassembled periplasmic SefA fimbriins purified from *Escherichia coli* expressing cloned *sefA* and *sefB* were readily soluble in aqueous solution. **Fimbrial** and periplasmic SefA also differed in their reaction with an anti-SEF14 monoclonal **antibody** and in their surface hydrophobicity, indicating that the two forms had different properties. Precise mass measurements of periplasmic and **fimbrial** SefA by mass spectroscopy showed that these variations were not due to post-translational modifications. Periplasmic SefA consisted primarily of intact as well as N-terminally truncated forms. The main 24 amino acid, N-terminally truncated form of periplasmic SefA was present as a 12.2 kDa monomer which had a low tendency to dimerize whereas intact periplasmic SefA was present as a 34.1 kDa homodimer. Intact periplasmic SefA also formed stable multimers at low concentrations of chemical cross-linker but multimerization of the truncated form required high concentrations of protein or cross-linker. Thus, SefA fimbriins appear to multimerize through their N-termini and undergo a conformational change prior to assembly into fibers. Within these fibers, subunit-subunit contact is maintained through strong hydrophobic interactions.

Tags: Research Support, Non-U.S. Gov't

Descriptors: \*Bacterial Proteins--chemistry--CH; \*Fimbriae Proteins; \*Salmonella enteritidis--chemistry--CH; Cloning, Molecular; Cross-Linking Reagents--metabolism--ME; Periplasm--chemistry--CH; Pili, Sex--chemistry--CH; Protein Conformation; Recombinant Proteins--chemistry--CH; Succinimides--metabolism--ME; Ultracentrifugation

CAS Registry No.: 0 (Bacterial Proteins); 0 (Cross-Linking Reagents); 0 (Recombinant Proteins); 0 (Succinimides); 0 (*sefA* protein, *Salmonella enteritidis*); 147680-16-8 (Fimbriae Proteins); 82436-77-9 (bis(sulfosuccinimidyl)suberate)

Record Date Created: 19981113

Record Date Completed: 19981113

6/9/3 (Item 3 from file: 155)

DIALOG(R) File 155:MEDLINE(R)

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12432596 PMID: 9744035

[Agglutination of hen egg-yolk immunoglobulins (IgY) against *Salmonella enterica*, serovar *enteritidis*]

Aglutinacion de inmunoglobulinas de yema de huevo de gallina (IgY) contra *Salmonella enterica* serovariedad *enteritidis*.

Terzolo H R; Sandoval V E; Caffer M I; Terragno R; Alcain A

INTA EEA Balcarce, Departamento de Produccion Animal, Argentina.

Revista Argentina de microbiologia (ARGENTINA) Apr-Jun 1998, 30 (2) p84-92, ISSN 0325-7541 Journal Code: 8002834

Publishing Model Print

Document type: Journal Article ; English Abstract

Languages: SPANISH

Main Citation Owner: NLM

Record type: MEDLINE; Completed

Subfile: INDEX MEDICUS

Two groups of 6 laying hens were used to produce IgY. In the vaccinated group (V), hens were injected by intramuscular route with two doses of a *Salmonella enterica* serovar **Enteritidis** bacterin at 20-day interval. In the control group (T) hens remained unvaccinated. Four IgY extractions were performed on the egg production of both groups. The first two extractions were carried out using the yolks obtained from the eggs produced during the 4th and 5th post-vaccination week (extracts 1V and 1T) and the other two using the ones from the 6th, 7th and 8th week (2V and 2T). Starting from the extracts 1V and 1T other products were obtained by freezing-thawing (1V-A and 1T-A) and simple (1V-B and 1T-B) or double (1V-C and 1T-C) flow capillary dialysis concentration. All these products were compared using an ELISA test specific for the detection of chicken **antibodies** against **flagellar** antigens of *S. Enteritidis*. In this test, V extracts were positive whereas T extracts were negative. The extract 1V was more positive than the extract 2V. The extract 1V-C was the most positive and was therefore selected to be used as an **antiserum** in the agglutination tests. This extract contained 1.9 g/dl of total proteins, 0.028 g/dl of triglycerides and 0.012 g/dl of cholesterol and showed an electrophoretic pattern characteristic of IgY. The 1T-C extract was used as a negative control in the agglutination tests. Slide somatic and tube **flagellar** agglutination tests were simultaneously carried out using both IgY extracts and a standard rabbit anti-*Salmonella* (IgG) sera. Overall 367 strains from the Enterobacteriaceae family were tested together with two other strains belonging to the Vibrionaceae family. The 1V-C extract specifically agglutinated *S. Enteritidis* strains in the same way as the rabbit sera. This extract also agglutinated other *Salmonella* strains antigenically related to *S. Enteritidis*. *Salmonella* which did not share somatic or **flagellar** antigens with *S. Enteritidis*, other different species of the Enterobacteriaceae family and the two strains of the Vibrionaceae family were all negative. None of the strains tested was agglutinated by the 1T-C extract. This paper show that it is possible to use specific IgY to identify *S. enterica* serovars. The more extended use of IgY for diagnostic purposes may be a convenient way to complement the current use of mammal polyclonal **antibodies**.

Tags: Comparative Study; Female

Descriptors: \*Agglutination Tests; \*Antibodies, Bacterial--immunology--IM; \*Bacterial Vaccines--immunology--IM; \*Chickens--immunology--IM; \*Egg Proteins--immunology--IM; \*Immunoglobulins--immunology--IM; \*Poultry Diseases--diagnosis--DI; \*Salmonella Infections, Animal--diagnosis--DI; \*Salmonella enterica--immunology--IM; Animals; Enterobacteriaceae--immunology--IM; Injections, Intramuscular; Poultry Diseases--immunology--IM; Poultry Diseases--prevention and control--PC; Rabbits; Salmonella Infections, Animal--immunology--IM; Salmonella Infections, Animal--prevention and control--PC; Salmonella enterica--classification--CL; Serotyping; Species Specificity; Vaccination--veterinary--VE; Vibrionaceae--immunology--IM

CAS Registry No.: 0 (Antibodies, Bacterial); 0 (Bacterial Vaccines); 0 (Egg Proteins); 0 (IgY); 0 (Immunoglobulins)

Record Date Created: 19981119

Record Date Completed: 19981119

6/9/6 (Item 6 from file: 155)

DIALOG(R) File 155:MEDLINE(R)

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12241422 PMID: 9549856

**Characterisation of epitopes of type 1 fimbriae of Salmonella using monoclonal antibodies specific for SEF21 fimbriae of Salmonella enteritidis .**

Sojka M G; Carter M A; Thorns C J

Department of Bacteriology, Central Veterinary Laboratory, Surrey, UK.

Veterinary microbiology (NETHERLANDS) Jan 16 1998, 59 (2-3) p157-74,  
ISSN 0378-1135 Journal Code: 7705469

Publishing Model Print

Document type: Journal Article

Languages: ENGLISH

Main Citation Owner: NLM

Record type: MEDLINE; Completed

Subfile: INDEX MEDICUS

Monoclonal antibodies (mAbs) were used to identify and characterise epitopes of type 1 (SEF21) fimbriae of Salmonella enteritidis . The distribution of the epitopes among salmonellas and other enterobacteria was investigated, as well as the influence of growth media and temperatures on their expression. At least four different epitope clusters were identified on SEF21 fimbriae of S. enteritidis . Two of these clusters were associated with fimbrial haemagglutinins that were either common to all salmonellae tested, or restricted only to S. enteritidis and S. dublin. The four epitope clusters were identified on type 1 fimbriae of most Salmonella serotypes, as well as non-haemagglutinating type 2 fimbriae of S. pullorum and S. gallinarum, and on many other enterobacterial species. The expression of the epitopes was affected by growth conditions.

Tags: Research Support, Non-U.S. Gov't

Descriptors: \*Antibodies, Monoclonal--immunology--IM; \*Antigens, Bacterial--chemistry--CH; \*Epitopes--analysis--AN; \* Fimbriae , Bacterial--immunology--IM; \*Salmonella enteritidis --immunology--IM; Animals; Antibodies , Bacterial--immunology--IM; Antigens, Bacterial--immunology--IM; Binding, Competitive; Enzyme-Linked Immunosorbent Assay; Epitopes--immunology--IM; Fimbriae , Bacterial--chemistry--CH; Gene Expression Regulation, Bacterial; Glycerol--metabolism--ME; Guanidine--metabolism--ME; Hemagglutination Inhibition Tests; Hemagglutination Tests; Latex Fixation Tests; Mice; Salmonella enteritidis --chemistry--CH

CAS Registry No.: 0 (Antibodies, Bacterial); 0 (Antibodies, Monoclonal); 0 (Antigens, Bacterial); 0 (Epitopes); 113-00-8 (Guanidine); 56-81-5 (Glycerol)

Record Date Created: 19980520

Record Date Completed: 19980520

6/9/7 (Item 7 from file: 155)

DIALOG(R) File 155:MEDLINE(R)

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12147843 PMID: 9449861

**Expression of SEF17 fimbriae by Salmonella enteritidis.**

Dibb-Fuller M; Allen-Vercoe E; Woodward M J; Thorns C J

Bacteriology Department, Central Veterinary Laboratory, Addlestone, Surrey, UK.

Letters in applied microbiology (ENGLAND) Dec 1997, 25 (6) p447-52,  
ISSN 0266-8254 Journal Code: 8510094

Publishing Model Print

Document type: Journal Article

Languages: ENGLISH

Main Citation Owner: NLM

Record type: MEDLINE; Completed

Subfile: BIOTECHNOLOGY

Specific immunological reagents were used to investigate the expression of SEF17 **fimbriae** by cultured strains of *Salmonella enteritidis*. Most strains of *Salm. enteritidis* tested expressed SEF17 when cultured at temperatures of 18-30 degrees C. However, two wild-type strains produced SEF17 when also grown at 37 degrees C and 42 degrees C. Colonization factor antigen agar was the optimum medium for SEF17 expression, whereas Drigalski and Sensitest agars poorly supported SEF17 production. Very fine **fimbriae** produced by a strain of *Salm. typhimurium* were specifically and strongly labelled by SEF17 monoclonal and polyclonal **antibodies**, indicating considerable antigenic conservation between the two. Curli **fimbriae** from *Escherichia coli* were similarly labelled. The production of these **fimbriae** correlated with the binding of fibronectin by the organism. Congo red binding by cultured bacteria was not a reliable criterion for the expression of SEF17 **fimbriae**.

Tags: Female; Research Support, Non-U.S. Gov't

Descriptors: \*Fimbriae, Bacterial--ultrastructure--UL; \*Salmonella enteritidis--ultrastructure--UL; Animals; Antibodies, Monoclonal--immunology--IM; Chickens; Culture Media; Fibronectins--metabolism--ME; Mice; Mice, Inbred BALB C; Microscopy, Immunoelectron; Temperature

CAS Registry No.: 0 (Antibodies, Monoclonal); 0 (Culture Media); 0 (Fibronectins)

Record Date Created: 19980212

Record Date Completed: 19980212

6/9/8 (Item 8 from file: 155)

DIALOG(R) File 155:MEDLINE(R)

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11903920 PMID: 9181610

**Assessing the sensitivity of egg yolk antibody testing for detecting *Salmonella enteritidis* infections in laying hens.**

Gast R K; Porter R E; Holt P S

USDA-Agricultural Research Service, Athens, Georgia 30605, USA.

Poultry science (UNITED STATES) Jun 1997, 76 (6) p798-801, ISSN 0032-5791 Journal Code: 0401150

Publishing Model Print

Document type: Journal Article

Languages: ENGLISH

Main Citation Owner: NLM

Record type: MEDLINE; Completed

Subfile: INDEX MEDICUS

The identification of infected commercial poultry flocks has become a pivotal component of efforts to reduce the incidence of egg-associated transmission of *Salmonella enteritidis* to humans. To assess the sensitivity with which testing for specific **antibodies** in egg yolks can be applied to detect *S. enteritidis* infection in laying chickens, groups of hens were orally inoculated with either 10(3), 10(5), or 10(7) cfu of a phage type 13a strain of *S. enteritidis*. Eggs from these hens were collected for 4 wk after inoculation and yolk samples were tested for **antibodies** to *S. enteritidis* flagella by ELISA. All hens that were inoculated with 10(7) cfu of *S. enteritidis* were detected as infected by the egg yolk ELISA when eggs were tested individually, as were up to 66 and 35% of hens inoculated with 10(5) or 10(3) cfu, respectively. Even when yolks from infected hens were diluted 1:10 in yolk from uninfected hens, specific **antibodies** could still be found in eggs from 31% of hens given

10(7) cfu of *S. enteritidis* and 13% of hens given 10(3) cfu. These results demonstrate that egg yolk **antibody** testing can provide a highly sensitive indication of prior exposure to *S. enteritidis*, and should accordingly be useful for verifying the effectiveness of programs designed to reduce the incidence of *S. enteritidis* infection in poultry.

Tags: Female

Descriptors: \*Antibodies, Bacterial--analysis--AN; \*Chickens  
--microbiology--MI; \*Egg Yolk--immunology--IM; \*Poultry Diseases--diagnosis  
--DI; \*Salmonella Infections, Animal--diagnosis--DI; \*Salmonella  
enteritidis--immunology--IM; Animals; Egg Yolk--microbiology--MI;  
Enzyme-Linked Immunosorbent Assay--methods--MT; Enzyme-Linked  
Immunosorbent Assay--veterinary--VE; Incidence; Poultry Diseases  
--epidemiology--EP; Poultry Diseases--immunology--IM; Salmonella  
Infections, Animal--epidemiology--EP; Salmonella Infections, Animal  
--immunology--IM; Salmonella enteritidis--isolation and purification--IP;  
Salmonella enteritidis--physiology--PH; Sensitivity and Specificity;  
Specific Pathogen-Free Organisms

CAS Registry No.: 0 (Antibodies, Bacterial)

Record Date Created: 19970827

Record Date Completed: 19970827

6/9/9 (Item 9 from file: 155)

DIALOG(R) File 155:MEDLINE(R)

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11830151 PMID: 9087337

**Applying tests for specific yolk antibodies to predict contamination by *Salmonella enteritidis* in eggs from experimentally infected laying hens.**

Gast R K; Porter R E; Hold P S

USDA-ARS, Southeast Poultry Research Laboratory, Athens, Georgia 30605, USA.

Avian diseases (UNITED STATES) Jan-Mar 1997, 41 (1) p195-202, ISSN 0005-2086 Journal Code: 0370617

Publishing Model Print

Document type: Journal Article

Languages: ENGLISH

Main Citation Owner: NLM

Record type: MEDLINE; Completed

Subfile: INDEX MEDICUS

Detecting *Salmonella enteritidis* contamination in eggs has become the cornerstone of many programs for reducing egg-borne disease transmission, but egg culturing is time consuming and laborious. Preliminary screening tests are thus generally applied to minimize the number of flocks from which eggs must be cultured. The usefulness of such tests is directly proportional to both their detection sensitivity and their ability to predict the likelihood of egg contamination. In the present study, samples were collected for 24 days after groups of laying hens were orally inoculated with *S. enteritidis*. Eggs from each hen were cultured for *S. enteritidis* in the contents and samples of egg yolk were diluted and tested for specific **antibodies** to *S. enteritidis* **flagella** using both experimental and commercially available enzyme-linked immunosorbent assay (ELISA) methods. Samples of voided feces were also collected regularly from each bird and cultured for *S. enteritidis*. Although fecal shedding and egg yolk **antibody** production followed opposite patterns over time (fecal shedding was decreasing as egg yolk **antibody** titers were increasing), tests for both parameters were effective in predicting whether particular hens would lay contaminated eggs. Among hens that laid at least one egg

contaminated by *S. enteritidis*, 82% were detected as infected by fecal culturing and 96% by the experimental egg yolk ELISA test. Using easily collected samples, egg yolk **antibody** testing offers a rapid and effective screening method for identifying *S. enteritidis*-infected laying flocks that might lay contaminated eggs.

Tags: Female

Descriptors: \*Antibodies, Bacterial--analysis--AN; \*Egg Yolk--immunology--IM; \*Eggs--microbiology--MI; \*Food Microbiology; \*Salmonella Infections, Animal--immunology--IM; \*Salmonella enteritidis--immunology--IM; Animals; Chickens; Egg Yolk--microbiology--MI; Enzyme-Linked Immunosorbent Assay--methods--MT; Feces--microbiology--MI; Flagella--immunology--IM; Oviposition; Predictive Value of Tests; Probability; Salmonella Infections, Animal--diagnosis--DI; Salmonella Infections, Animal--transmission--TM; Time Factors

CAS Registry No.: 0 (Antibodies, Bacterial)

Record Date Created: 19970609

Record Date Completed: 19970609

6/9/11 (Item 11 from file: 155)

DIALOG(R) File 155:MEDLINE(R)

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11634056 PMID: 8945540

**In vitro attachment and invasion of chicken ovarian granulosa cells by *Salmonella enteritidis* phage type 8.**

Thiagarajan D; Saeed M; Turek J; Asem E

Department of Veterinary Pathobiology, School of Veterinary Medicine, Purdue University, West Lafayette, Indiana 47907, USA.

Infection and immunity (UNITED STATES) Dec 1996, 64 (12) p5015-21, ISSN 0019-9567 Journal Code: 0246127

Publishing Model Print

Document type: Journal Article

Languages: ENGLISH

Main Citation Owner: NLM

Record type: MEDLINE; Completed

Subfile: INDEX MEDICUS

The attachment and invasion of chicken ovarian granulosa cells by *Salmonella enteritidis* was examined in vitro. The attachment was inhibited by preincubation of granulosa cells with anti-chicken fibronectin antibody (approximately 70% reduction in attachment) or preincubation with a 14-kDa fimbrial protein isolated from *S. enteritidis* (68% reduction in attachment). Treatment of bacterial cells with the tetrapeptide RGDS before addition to granulosa cells resulted in inhibition of attachment (60% inhibition when  $2 \times 10^7$  CFU of bacteria was treated with 500 microg of peptide). Treatment with the peptide GRGD resulted in similar magnitude of inhibition, indicating that extracellular matrix proteins play significant roles in the interaction of *S. enteritidis* with granulosa cells. In contrast, treatment of the bacterial cells with the peptide GRAD did not result in significant inhibition of attachment to the granulosa cells. *S. enteritidis* was found to attach specifically to fibronectin, collagen IV, and laminin-coated microtiter plate wells, with the rank order of attachment as follows: fibronectin > laminin > collagen IV. Light and transmission electron micrographs of *S. enteritidis* invasion of granulosa cells showed organisms with or without a surrounding membrane in the cytoplasm of granulosa cells. In some instances, dividing bacterial cells were observed in the cytoplasm. Results of this study demonstrated that *S. enteritidis* interacts with granulosa cells in a specific manner and can invade and multiply in these cells. The granulosa cell layer of the

preovulatory follicles may be a preferred site for the colonization of the chicken ovaries by invasive strains of *S. enteritidis*.

Tags: Female; Research Support, Non-U.S. Gov't

Descriptors: \*Adhesins, Bacterial--physiology--PH; \*Bacterial Adhesion; \*Bacteriophages--physiology--PH; \*Granulosa Cells--microbiology--MI; \*Salmonella Infections, Animal--microbiology--MI; \*Salmonella enteritidis--physiology--PH; Animals; Chickens; Extracellular Matrix Proteins--physiology--PH; Granulosa Cells--virology--VI; Salmonella Infections, Animal--virology--VI; Salmonella enteritidis--virology--VI

CAS Registry No.: 0 (Adhesins, Bacterial); 0 (Extracellular Matrix Proteins)

Record Date Created: 19970108

Record Date Completed: 19970108

6/9/12 (Item 12 from file: 155)

DIALOG(R) File 155:MEDLINE(R)

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11620907 PMID: 8933590

**Experimental infection of laying hens with Salmonella enteritidis strains that express different types of fimbriae.**

Thiagarajan D; Thacker H L; Saeed A M

Department of Veterinary Pathobiology, School of Veterinary Medicine, Purdue University, West Lafayette, Indiana 47907, USA.

Poultry science (UNITED STATES) Nov 1996, 75 (11) p1365-72, ISSN 0032-5791 Journal Code: 0401150

Publishing Model Print

Document type: Journal Article

Languages: ENGLISH

Main Citation Owner: NLM

Record type: MEDLINE; Completed

Subfile: INDEX MEDICUS

A study was conducted to compare the pathogenicity of three *Salmonella enteritidis* phage type 8 strains (9, 21, and 30) in 30-wk-old laying hens. Strain 9 expressed two types of **fimbriae** of 14 and 21 kDa. Strain 30 expressed a single **fimbrial** type (21 kDa). Strain 21 did not express any **fimbrial** protein. Laying hens were divided into three groups of 35 each and each group was orally inoculated with a single *S. enteritidis* strain (1 x 10<sup>8</sup> cfu per bird). Significantly less intensive cecal colonization and fecal shedding of the organism were observed in hens that were inoculated with the strain that did not express **fimbriae** than in birds inoculated with other two strains (P < 0.05). Isolation of *S. enteritidis* from liver, spleen, reproductive organs, and egg contents did not differ between groups. Mean serum *S. enteritidis* lipopolysaccharide-specific **antibody** titers of birds inoculated with strain 21 were lower than titers of hens that were inoculated with the other two strains from the 5th wk through the end of the trial. Immunoblot of the bacterial outer membrane structures revealed the presence of serum **antibodies** against lipopolysaccharide, membrane-associated proteins, and purified 14 kDa **fimbrial** protein in birds inoculated with strain 9 as late as 9 wk postinoculation. Results of this study are consistent with a role for **fimbrial** proteins in the cecal colonization by *S. enteritidis*. In addition, cecal colonization mediated by **fimbrial** proteins may enhance the elicitation of humoral **immune** response against *S. enteritidis*.

Tags: Female; Research Support, Non-U.S. Gov't

Descriptors: \*Chickens--microbiology--MI; \*Fimbriae, Bacterial--ultrastructure--UL; \*Poultry Diseases--classification--CL; \*Salmonella

Infections, Animal--classification--CL; \*Salmonella enteritidis  
 --classification--CL; \*Salmonella enteritidis--ultrastructure--UL; Animals  
 ; Antibodies, Bacterial--blood--BL; Antibodies, Bacterial--metabolism--ME;  
 Bacterial Proteins--physiology--PH; Cecum--microbiology--MI; Chickens  
 --immunology--IM; Eggs--microbiology--MI; Electrophoresis, Polyacrylamide  
 Gel--veterinary--VE; Feces--microbiology--MI; Immunoblotting--veterinary  
 --VE; Liver--microbiology--MI; Ovary--microbiology--MI; Poultry Diseases  
 --immunology--IM; Poultry Diseases--physiopathology--PP; Salmonella  
 Infections, Animal--immunology--IM; Salmonella Infections, Animal  
 --physiopathology--PP; Salmonella enteritidis--isolation and purification  
 --IP; Spleen--microbiology--MI  
 CAS Registry No.: 0 (Antibodies, Bacterial); 0 (Bacterial Proteins)  
 Record Date Created: 19970227  
 Record Date Completed: 19970227

6/9/13 (Item 13 from file: 155)  
 DIALOG(R) File 155:MEDLINE(R)  
 (c) format only 2005 The Dialog Corp. All rts. reserv.

11558280 PMID: 8870619

**A novel relationship between O-antigen variation, matrix formation, and invasiveness of Salmonella enteritidis.**

Guard-Petter J; Keller L H; Rahman M M; Carlson R W; Silvers S  
 USDA/ARS, Southeast Poultry Research Laboratory, Athens, GA 30605, USA.  
 Epidemiology and infection (ENGLAND) Oct 1996, 117 (2) p219-31,  
 ISSN 0950-2688 Journal Code: 8703737

Publishing Model Print  
 Document type: Journal Article  
 Languages: ENGLISH  
 Main Citation Owner: NLM  
 Record type: MEDLINE; Completed  
 Subfile: INDEX MEDICUS

Salmonella enterica **Enteritidis** in chickens serves as a reservoir for salmonellosis in humans and the structure of its lipopolysaccharide (LPS) has been used to assess invasiveness. Culture from chick spleens generated colonies with an unusual wrinkled morphology, and it is designated the lacy phenotype. The characterize the nature of the morphological change, three isogenic variants were compared. Only the lacy phenotype produced a temperature-dependent cell surface matrix composed of several proteins in association with LPS high molecular weight O-antigen. **Flagellin** and a 35 kDa protein were identified as specific proteinaceous components of matrix. Both proteins cross-reacted with a monoclonal **antibody** previously determined to specifically detect the g-epitope of the **Enteritidis** monophasic **flagella** (H-antigen). These results suggest that O-antigen in association with protein contributes to cross-reactivity between molecules. The lacy phenotype was more organ invasive in 5-day-old chicks than isogenic variants producing low molecular weight O-antigen. However, it was no more efficient at contaminating eggs after oral inoculation of hens than a variant that completely lacked O-antigen, thus the lacy phenotype is classified as an intermediately invasive organism. The distinctive colonial phenotype of SE6-E21lacy was used to investigate environmental factors that decreased O/C ratios and contributed to attenuation. In so doing, it was found that growth in complement at 46 degrees C caused matrix producing cells to hyperflagellate and migrate across agar surfaces. These results suggest that the structure of O-antigen might influence the secretion and/or the function of **Enteritidis** cell-surface proteins. The data also reveal a greater heterogeneity than has been assumed in the phenotype, and possibly the infectious behaviour, of **Enteritidis**.

Tags: Research Support, U.S. Gov't, Non-P.H.S.

Descriptors: \*Antigenic Variation--immunology--IM; \*Extracellular Matrix Proteins--physiology--PH; \*O Antigens--immunology--IM; \*Salmonella enteritidis--genetics--GE; \*Salmonella enteritidis--immunology--IM; Animals; Chickens; Immunoblotting; Molecular Weight; Phenotype; Poultry Diseases--microbiology--MI; Salmonella Infections, Animal--microbiology--MI; Salmonella enteritidis--pathogenicity--PY; Serotyping; Spleen--microbiology--MI

CAS Registry No.: 0 (Extracellular Matrix Proteins); 0 (O Antigens)

Record Date Created: 19961120

Record Date Completed: 19961120

6/9/16 (Item 16 from file: 155)

DIALOG(R) File 155:MEDLINE(R)

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11333201 PMID: 8677603

Evaluation of SEF14 fimbrial dot blot and flagellar western blot tests as indicators of Salmonella enteritidis infection in chickens.

Cooper G L; Thorns C J

Veterinary Laboratories Agency, New Haw, Addlestone, Surrey.

Veterinary record (ENGLAND) Feb 17 1996, 138 (7) p149-53, ISSN

0042-4900 Journal Code: 0031164

Publishing Model Print

Document type: Journal Article

Languages: ENGLISH

Main Citation Owner: NLM

Record type: MEDLINE; Completed

Subfile: INDEX MEDICUS

The serological responses to Salmonella enteritidis flagella (H: g,m) and its fimbrial antigen SEF14 were evaluated as indicators of infection in chickens and to confirm serological results obtained by an ELISA using S enteritidis lipopolysaccharide (LPS) (O: 9,12) as the detecting antigen.

The SEF14 antigen and flagella were extracted from S enteritidis and transferred to nitrocellulose paper for use in Western and dot blot tests. Antisera to 19 salmonella serotypes including S enteritidis were raised in rabbits and their cross reactivity to the flagellar and SEF14 antigens was evaluated. Cross reactivity with the SEF14 antigen was found in one antiserum, raised against S blegdam, and to flagella in eight of 19 antisera raised against various salmonella serotypes, most of which shared the flagellar factors g or m with S enteritidis. The intensity of cross reaction to flagella was strongest in S derby and S blegdam antisera.

Antisera raised in chickens against S typhimurium and S panama did not cross react in either test, and neither did pooled sera from eight-week-old salmonella-free, broiler breeder parent chickens. Field sera from two commercial flocks with no history of salmonella infection were negative when tested by the LPS ELISA. These sera were also negative when tested by the flagellar and SEF14 blots. S enteritidis infection in a commercial laying flock was detected initially when the sera were tested by the LPS ELISA and confirmed in individual and pooled sera by the SEF14 and flagellar tests. S enteritidis PT4 was isolated from this flock post mortem.

Descriptors: \*Antibodies, Bacterial--analysis--AN; \*Antigens, Bacterial--immunology--IM; \*Chickens; \*Poultry Diseases--diagnosis--DI; \*Salmonella Infections, Animal--diagnosis--DI; \*Salmonella enteritidis--immunology--IM; Animals; Antibodies, Bacterial--immunology--IM; Antigens, Bacterial--diagnostic use--DU; Blotting, Western--methods--MT; Blotting, Western

--standards--ST; Blotting, Western--veterinary--VE; Cross Reactions;  
Enzyme-Linked Immunosorbent Assay--veterinary--VE; Evaluation Studies;  
Fimbriae, Bacterial--immunology--IM; Flagella--immunology--IM; Immune Sera  
--immunology--IM; Immunoblotting--methods--MT; Immunoblotting--standards  
--ST; Immunoblotting--veterinary--VE; Poultry Diseases--immunology--IM;  
Rabbits; Salmonella Infections, Animal--immunology--IM

CAS Registry No.: 0 (Antibodies, Bacterial); 0 (Antigens, Bacterial);  
0 (Immune Sera)

Record Date Created: 19960815

Record Date Completed: 19960815

6/9/17 (Item 17 from file: 155)

DIALOG(R) File 155:MEDLINE(R)

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11292606 PMID: 8605578

**Salmonella fimbriae: novel antigens in the detection and control of salmonella infections.**

Thorns C J

Bacteriology Department, Central Veterinary Laboratory, New Haw,  
Addlestone, UK.

British veterinary journal (ENGLAND) Nov-Dec 1995, 151 (6) p643-58,  
ISSN 0007-1935 Journal Code: 0372554

Publishing Model Print

Document type: Journal Article; Review; Review, Tutorial

Languages: ENGLISH

Main Citation Owner: NLM

Record type: MEDLINE; Completed

Subfile: INDEX MEDICUS

**Fimbriae** are thin, proteinaceous surface organelles produced by members of the Enterobacteriaceae, including most salmonellas. A number of **fimbrial** antigens expressed by strains of *Salmonella enteritidis* and *S. typhimurium* have now been described and characterized. However, their functions are still poorly understood, although some evidence indicates they have a role in bacterial survival in the host or external environment. Diagnostic tests based on the detection of **fimbriae** or specific **antibodies** against them have recently been developed and applied successfully to the rapid and specific identification of *S. enteritidis* infections. The role of salmonella **fimbriae** in future generations of live vaccines either as protective antigens or as the carriers of heterologous antigens is also discussed. (82 Refs.)

Descriptors: \*Fimbriae, Bacterial--physiology--PH; \*Salmonella  
--ultrastructure--UL; Bacterial Vaccines; Fimbriae, Bacterial  
--classification--CL; Fimbriae, Bacterial--genetics--GE; Fimbriae,  
Bacterial--ultrastructure--UL; Salmonella--isolation and purification--IP;  
Salmonella--pathogenicity--PY; Virulence

CAS Registry No.: 0 (Bacterial Vaccines)

Record Date Created: 19960520

Record Date Completed: 19960520

6/9/18 (Item 18 from file: 155)

DIALOG(R) File 155:MEDLINE(R)

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10892656 PMID: 7533759

**Identification of the domain which determines the g,m serotype of the**

**flagellin of Salmonella enteritidis.**

van Asten A J; Zwaagstra K A; Baay M F; Kusters J G; Huis in't Veld J H;  
van der Zeijst B A

Department of Bacteriology, University of Utrecht, The Netherlands.

Journal of bacteriology (UNITED STATES) Mar 1995, 177 (6) p1610-3,

ISSN 0021-9193 Journal Code: 2985120R

Publishing Model Print

Document type: Journal Article

Languages: ENGLISH

Main Citation Owner: NLM

Record type: MEDLINE; Completed

Subfile: INDEX MEDICUS

Clones expressing fragments of the **flagellin** protein of *Salmonella enteritidis* were constructed and screened with a g,m-specific monoclonal antibody. Results showed that the g,m epitope is localized between amino acids 258 and 348 of the **flagellin**. The *fliC* gene, encoding the **flagellin** of *S. enteritidis*, was proven to be the only **flagellin** gene present in *S. enteritidis*.

Tags: Comparative Study

Descriptors: \*Antigens, Bacterial--immunology--IM; \*Epitopes--immunology--IM; \*Flagellin--immunology--IM; \*Salmonella enteritidis--immunology--IM; Amino Acid Sequence; Antigens, Bacterial--genetics--GE; Base Sequence; Cloning, Molecular; Epitope Mapping; Epitopes--genetics--GE; Flagellin--genetics--GE; Molecular Sequence Data; Peptide Fragments--genetics--GE; Peptide Fragments--immunology--IM; Salmonella enteritidis--genetics--GE; Sequence Homology, Amino Acid; Serotyping

Molecular Sequence Databank No.: GENBANK/U12963

CAS Registry No.: 0 (Antigens, Bacterial); 0 (Epitopes); 0 (Peptide Fragments); 12777-81-0 (Flagellin); 156066-56-7 (FlaC protein)

Record Date Created: 19950413

Record Date Completed: 19950413

6/9/19 (Item 19 from file: 155)

DIALOG(R) File 155:MEDLINE(R)

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10878145 PMID: 7870071

**fimA and tctC based DNA diagnostics for Salmonella.**

Doran J L; Collinson S K; Kay C M; Baner P A; Burian J; Munro C K; Lee S H; Somers J M; Todd E C; Kay W W

Department of Microbiology and Biochemistry, University of Victoria, British Columbia, Canada.

Molecular and cellular probes (ENGLAND) Aug 1994, 8 (4) p291-310,

ISSN 0890-8508 Journal Code: 8709751

Publishing Model Print

Document type: Journal Article

Languages: ENGLISH

Main Citation Owner: NLM

Record type: MEDLINE; Completed

Subfile: INDEX MEDICUS

Immunochemical analyses of 85 isolates of 17 *Salmonella* serovars using polyclonal antiserum to SEF21, the type 1 **fimbriae** of *Salmonella enteritidis*, demonstrated antigenic relatedness among both type 1 and type 2 **fimbriae** of *Salmonella*. However, anti-SEF21 antiserum was not entirely suitable as a *Salmonella* diagnostic probe due either to a variability of, or a rare deficiency of, detectable **fimbriae**. Partial amino acid sequence analyses of the SEF21 structural fimbriin protein

revealed 99% homology to *Salmonella typhimurium* FimA. Therefore, oligonucleotide probes for *Salmonella* detection were designed following sequencing of *S. enteritidis* fimA and comparison to the corresponding genes of *S. typhimurium*, *Escherichia coli*, *Klebsiella pneumoniae* and *Serratia marcescens*. One oligonucleotide probe hybridized to all 612 *Salmonella* isolates of 89 serovars tested while two other probes detected 97.5% and 99.7% of the isolates. Three consistently weak positive reactions were obtained, therefore, inclusivity was optimized by identification of a *Salmonella*-specific tctC DNA probe that detected 609 of 612 *Salmonella* isolates. No hybridization of these *Salmonella* probes was detected to 250 other Enterobacteriaceae isolates or to 14 other eubacterial species. Therefore, in combination, DNA probes to fimA and tctC proved to be highly reliable diagnostics for *Salmonella* bacteria. Accordingly, PCR assays targeting fimA and tctC were developed.

Tags: Research Support, Non-U.S. Gov't

Descriptors: \*Bacterial Proteins--genetics--GE; \*Carrier Proteins--genetics--GE; \*DNA, Bacterial--genetics--GE; \*Fimbriae Proteins; \*Polymerase Chain Reaction; \*Salmonella--genetics--GE; \*Salmonella Infections--diagnosis--DI; Amino Acid Sequence; Base Sequence; Fimbriae, Bacterial--chemistry--CH; Humans; Molecular Sequence Data; Oligonucleotide Probes; Salmonella--classification--CL; Sequence Alignment; Sequence Homology; Serotyping; Species Specificity

Molecular Sequence Databank No.: GENBANK/S76043

CAS Registry No.: 0 (Bacterial Proteins); 0 (Carrier Proteins); 0 (DNA, Bacterial); 0 (Oligonucleotide Probes); 0 (citrate-binding transport protein); 0 (fimbriin); 147680-16-8 (Fimbriae Proteins)

Gene Symbol: fimA; tctB; tctC

Record Date Created: 19950330

Record Date Completed: 19950330

6/9/21 (Item 21 from file: 155)

DIALOG(R) File 155:MEDLINE(R)

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10755935 PMID: 7960117

**A *Salmonella enteritidis* 11RX pilin induces strong T-lymphocyte responses.**

Ogunniyi A D; Manning P A; Kotlarski I

Department of Microbiology and Immunology, University of Adelaide, Australia.

Infection and immunity (UNITED STATES) Dec 1994, 62 (12) p5376-83, ISSN 0019-9567 Journal Code: 0246127

Publishing Model Print

Document type: Journal Article

Languages: ENGLISH

Main Citation Owner: NLM

Record type: MEDLINE; Completed

Subfile: INDEX MEDICUS

Our previous work, using proteins fractionated by sodium dodecyl sulfate-polyacrylamide gel electrophoresis to define antigens of *Salmonella enteritidis* 11RX able to stimulate T cells from *S. enteritidis* 11RX-primed (BALB/c x C57BL/6)F1 mice, had indicated the presence of a major antigenic determinant of 14 to 18 kDa (H.-M. Vordermeier and I. Kotlarski, Immunol. Cell. Biol. 68:299-305, 1990). The 14-kDa size is similar to that of the monomeric units of one of the fimbrial structures, SEF14, produced by a human enteropathogen, *S. enteritidis* 27655 (J. Feutrier, W. W. Kay, and T. J. Trust, J. Bacteriol. 168:221-227, 1986). Here we present data which indicate that *S. enteritidis* 11RX also

produces this protein and that it is able to elicit delayed-type hypersensitivity reactions in *S. enteritidis* 11RX-primed animals and to stimulate in vitro proliferation of, and cytokine release from, T cells obtained from these animals, implying that this fimbrial protein is likely to be an important immunogen of *S. enteritidis*. The protein was purified to homogeneity and is free from contamination with lipopolysaccharide. Standard immunoblot analysis with unabsorbed *S. enteritidis* 11RX antiserum and antiserum absorbed with *Salmonella typhimurium* C5 and various strains of *Escherichia coli*, as well as a panel of anti-14-kDa-protein monoclonal antibodies, suggests that this fimbrial protein is not the common antigen expressed by a number of organisms belonging to the family Enterobacteriaceae. Immunogold electron microscopy with one of these monoclonal antibodies confirms that the 14-kDa protein and SEF14 are identical.

Tags: Female; Male; Research Support, Non-U.S. Gov't

Descriptors: \*Antigens, Bacterial--immunology--IM; \*Bacterial Proteins--immunology--IM; \*Fimbriae Proteins; \*Fimbriae, Bacterial--immunology--IM; \*Lymphocyte Activation; \*Salmonella enteritidis--immunology--IM; Amino Acid Sequence; Animals; Bacterial Proteins--isolation and purification--IP; Cross Reactions; Cytokines--secretion--SE; Fimbriae, Bacterial--ultrastructure--UL; Hypersensitivity, Delayed--immunology--IM; Mice; Mice, Inbred BALB C; Mice, Inbred C57BL; Microscopy, Immunoelectron; Molecular Sequence Data; Salmonella enteritidis--classification--CL; Salmonella enteritidis--ultrastructure--UL; Salmonella typhimurium--immunology--IM; T-Lymphocytes--immunology--IM

CAS Registry No.: 0 (Antigens, Bacterial); 0 (Bacterial Proteins); 0 (Cytokines); 0 (sefA protein, Salmonella enteritidis); 147680-16-8 (Fimbriae Proteins)

Record Date Created: 19941229

Record Date Completed: 19941229

6/9/22 (Item 22 from file: 155)

DIALOG(R) File 155:MEDLINE(R)

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10734883 PMID: 7940513

[Evaluation of three commercial ELISA test kits for the detection of antibodies against *Salmonella enteritidis*]

Beurteilung von drei kommerziellen ELISA-Teskits zum Nachweis von Antikörpern gegen *Salmonella enteritidis*.

Sachsenweger O; Lohr J E; Kusters J

Staatlichen Tierärztlichen Untersuchungsamt, Aulendorf.

Tierärztliche Praxis (GERMANY) Aug 1994, 22 (4) p350-7, ISSN 0303-6286 Journal Code: 7501042

Publishing Model Print

Document type: Journal Article ; English Abstract

Languages: GERMAN

Main Citation Owner: NLM

Record type: MEDLINE; Completed

Subfile: INDEX MEDICUS

We evaluated three commercial enzyme-linked immunoassay (ELISA) test-kits, using either lipopolysaccharide (LPS) or flagellar extracts as antigens, for the demonstration of *Salmonella enteritidis* (S. e.) antibodies in serum and egg yolk. They were also compared with conventional serological tests, such as the pullorum rapid slide agglutination test (RST), the pullorum slow agglutination tube test and a rapid slide agglutination test, using gm flagellar extracts as antigen.

We tested sera and eggs from six different layer flocks. In 84.1 to 90% of the sera and egg yolks tested the three commercial ELISA test kits gave comparable results. There were a number of serological cross-reaction with other serovars, particularly *S. typhimurium*. However, the possibility of infections with more than one salmonella serovar, other than *S. e.*, cannot be excluded. The ELISA- **antibody** levels in serum and egg yolk ran parallel and were still high after one year. However, the level of egg yolk **antibodies** was on an average 33.9% lower than in serum. The *S. e.*-ELISA seems to be well suited for epidemiological investigations and for preventive and control measures.

Tags: Comparative Study; Female

Descriptors: \*Antibodies, Bacterial--analysis--AN; \*Chickens; \*Poultry Diseases--diagnosis--DI; \*Salmonella Infections, Animal--diagnosis--DI; \*Salmonella enteritidis--immunology--IM; Agglutination Tests--veterinary--VE; Animals; Antibodies, Bacterial--blood--BL; Cross Reactions; Egg Yolk--immunology--IM; Enzyme-Linked Immunosorbent Assay--veterinary--VE; Evaluation Studies; Flagella--immunology--IM; Lipopolysaccharides--immunology--IM; Reagent Kits, Diagnostic--veterinary--VE; Reproducibility of Results

CAS Registry No.: 0 (Antibodies, Bacterial); 0 (Lipopolysaccharides); 0 (Reagent Kits, Diagnostic)

Record Date Created: 19941122

Record Date Completed: 19941122

6/9/23 (Item 23 from file: 155)

DIALOG(R) File 155:MEDLINE(R)

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10728954 PMID: 7934897

**Unique fimbriae-like structures encoded by sefD of the SEF14 fimbrial gene cluster of Salmonella enteritidis.**

Clouthier S C; Collinson S K; Kay W W

Department of Biochemistry and Microbiology, University of Victoria, British Columbia, Canada.

Molecular microbiology (ENGLAND) Jun 1994, 12 (6) p893-901, ISSN 0950-382X Journal Code: 8712028

Publishing Model Print

Document type: Journal Article

Languages: ENGLISH

Main Citation Owner: NLM

Record type: MEDLINE; Completed

Subfile: INDEX MEDICUS

The SEF14 gene cluster of *Salmonella enteritidis* was recently shown to contain three genes, sefABC, encoding a unique fimbrin, and proteins homologous to fimbrial chaperones and outer membrane proteins (ushers), respectively. A fourth open reading frame, designated sefD, was found immediately downstream of sefABC and overlapping sefC. The translated protein sequence of sefD was unique, but the composition was similar to that of other bacterial fimbriae. SefD was produced in abundance by wild-type *S. enteritidis* as shown by Western blot analysis using **antibodies** raised to affinity-purified, recombinant SefD. Furthermore, unusually long, thin, fimbriae-like structures were evident on *S. enteritidis* and *Escherichia coli* by immunoelectron microscopy, but in other bacterial species SefD was expressed as amorphous material. Therefore, in *S. enteritidis* and *E. coli*, SefD is the predominant structural subunit of SEF18. The SEF18 fimbriae-like structures were shown to be serologically distinct from the three known *S. enteritidis*

**fimbriae** SEF14, SEF17 and SEF21. Furthermore, SEF18 was still produced in *sefA* insertion mutants, indicating that SEF14 and SEF18 were structurally distinct. Thus, the SEF14 gene cluster is the first example in the Enterobacteriaceae of a gene cluster that encodes two fimbrin-like proteins, which are assembled into two distinct cell-surface structures, SEF14 and SEF18. DNA hybridization and Western blot analyses showed that *SefD* was widely distributed among the Enterobacteriaceae and was present in *E. coli*, *Shigella*, *Enterobacter*, *Citrobacter*, *Erwinia*, *Hafnia*, *Klebsiella*, *Providencia*, and *Proteus* but not in the non-Enterobacteriaceae Gram-negative bacteria *Pseudomonas* and *Aeromonas*, or in Gram-positive bacteria *Bacillus* or *Staphylococcus*. (ABSTRACT TRUNCATED AT 250 WORDS)

Tags: Research Support, Non-U.S. Gov't

Descriptors: \*Bacterial Proteins--genetics--GE; \*Fimbriae Proteins; \*Fimbriae, Bacterial--genetics--GE; \*Multigene Family--genetics--GE; \*Salmonella enteritidis--genetics--GE; Bacterial Proteins--biosynthesis--BI; Bacterial Proteins--chemistry--CH; Bacterial Proteins--immunology--IM; Base Sequence; Cell Adhesion Molecules--genetics--GE; Cloning, Molecular; DNA, Bacterial--analysis--AN; Fimbriae, Bacterial--ultrastructure--UL; Genes, Structural, Bacterial--genetics--GE; Molecular Sequence Data; Molecular Weight; Open Reading Frames--genetics--GE; Recombinant Fusion Proteins--biosynthesis--BI; Salmonella enteritidis--cytology--CY; Sequence Analysis, DNA; Species Specificity

Molecular Sequence Databank No.: GENBANK/U07129

CAS Registry No.: 0 (Bacterial Proteins); 0 (Cell Adhesion Molecules); 0 (DNA, Bacterial); 0 (Recombinant Fusion Proteins); 0 (*SefD* protein, *Salmonella*); 0 (*sefA* protein, *Salmonella enteritidis*); 147680-16-8 (Fimbriae Proteins)

Gene Symbol: *sefD*

Record Date Created: 19941107

Record Date Completed: 19941107

6/9/25 (Item 25 from file: 155)

DIALOG(R) File 155:MEDLINE(R)

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10617731 PMID: 7911840

**Passive immunisation against experimental salmonellosis in mice by orally administered hen egg-yolk antibodies specific for 14-kDa fimbriae of *Salmonella enteritidis*.**

Peralta R C; Yokoyama H; Ikemori Y; Kuroki M; Kodama Y

Immunology Research Institute, Gifu City, Japan.

Journal of medical microbiology (SCOTLAND) Jul 1994, 41 (1) p29-35, ISSN 0022-2615 Journal Code: 0224131

Publishing Model Print

Document type: Journal Article

Languages: ENGLISH

Main Citation Owner: NLM

Record type: MEDLINE; Completed

Subfile: INDEX MEDICUS

Chickens were immunised with a preparation of purified 14-kDa **fimbriae** of *Salmonella* serotype **Enteritidis** (SEF 14) to raise egg-yolk antibodies for protection trials in mice against subsequent challenge-exposure with the homologous strain of **Enteritidis**. A pronounced specificity of egg-yolk **antibodies** against the 14-kDa **fimbrial** antigen was demonstrated by Western blotting analysis. Passive **antibody** protection was evaluated in a mouse model of experimental salmonellosis: 79 mice (CD 1 strain) were challenged orally with  $2 \times 10^{10}$  cfu of **Enteritidis**. Test

mice treated with SEF-14 **antibodies** (titre = 128) had a survival rate of 77.8% compared to 32% survival in control mice fed normal egg-yolk **antibodies** (titre < 10) ( $p < 0.01$ ). In-vitro adhesion of **Enteritidis** to mouse intestinal epithelial cells was reduced by anti- **fimbrial antibodies** . An indirect immunofluorescence method demonstrated the localisation of **Enteritidis** along the villous margins of the small intestine of control mice, whereas in test mice adherent bacteria were not detected. Results suggest that 14-kDa **fimbriae** may influence, enhance or contribute to the overall adhesive properties of **Enteritidis** and that egg-yolk **antibodies** directed against these **fimbriae** may have played a substantial role in protection, possibly by minimising bacterial colonisation and invasion during the early stages of infection.

Descriptors: \***Antibodies** s, Bacterial--therapeutic use--TU; \* **Fimbriae** , Bacterial--immunology--IM; \*Immunization, Passive; \*Salmonella Infections, Animal--prevention and control--PC; \*Salmonella **enteritidis** --immunology --IM; Administration, Oral; Animals; Antibodies, Bacterial--administration and dosage--AD; Antibody Specificity; Bacterial Adhesion; Blotting, Western ; Chickens; Disease Models, Animal; Egg Yolk--immunology--IM; Fluorescent Antibody Technique; Intestine, Small--microbiology--MI; Mice; Microvilli --microbiology--MI; Salmonella enteritidis--pathogenicity--PY; Salmonella enteritidis--ultrastructure--UL; Virulence

CAS Registry No.: 0 (Antibodies, Bacterial)

Record Date Created: 19940721

Record Date Completed: 19940721

6/9/26 (Item 26 from file: 155)

DIALOG(R) File 155:MEDLINE(R)

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10558784 PMID: 8155479

**Serological diagnosis of Salmonella serotype enteritidis infections in poultry by ELISA and other tests.**

Barrow P A

Institute for Animal Health, Compton Laboratory, Newbury, Berkshire, England, UK.

International journal of food microbiology (NETHERLANDS) Jan 1994, 21 (1-2) p55-68, ISSN 0168-1605 Journal Code: 8412849

Publishing Model Print

Document type: Journal Article; Review; Review, Tutorial

Languages: ENGLISH

Main Citation Owner: NLM

Record type: MEDLINE; Completed

Subfile: INDEX MEDICUS

Serological methods have increasingly been used for the detection of invasive Salmonella serotypes including **enteritidis** in poultry. Different types of ELISA, particularly indirect or double **antibody** -blocking assays using a variety of antigens such as lipopolysaccharide, **flagella** and SEF14 **fimbrial** antigen are used as part of control programmes in a number of countries. There are many advantages to using such assays for preliminary screening of flocks prior to using bacteriological culture methods. (63 Refs.)

Descriptors: \*Antibodies, Bacterial--blood--BL; \*Enzyme-Linked Immunosorbent Assay--veterinary--VE; \*Poultry Diseases--diagnosis--DI; \*Salmonella Infections, Animal--diagnosis--DI; \*Salmonella enteritidis --immunology--IM; Agglutination Tests--veterinary--VE; Animals; Antigens, Bacterial--diagnostic use--DU; Immunoglobulin G--blood--BL; Poultry

CAS Registry No.: 0 (Antibodies, Bacterial); 0 (Antigens, Bacterial);

0 (Immunoglobulin G)  
Record Date Created: 19940519  
Record Date Completed: 19940519

6/9/27 (Item 27 from file: 155)  
DIALOG(R) File 155:MEDLINE(R)  
(c) format only 2005 The Dialog Corp. All rts. reserv.

10558783 PMID: 8155478

**The use of latex particle agglutination to specifically detect Salmonella enteritidis.**

Thorns C J; McLaren I M; Sojka M G  
Department of Bacteriology, Central Veterinary Laboratory, New Haw,  
Addlestone, Surrey, England, UK.  
International journal of food microbiology (NETHERLANDS) Jan 1994, 21  
(1-2) p47-53, ISSN 0168-1605 Journal Code: 8412849  
Publishing Model Print  
Document type: Journal Article; Review; Review, Tutorial  
Languages: ENGLISH  
Main Citation Owner: NLM  
Record type: MEDLINE; Completed  
Subfile: INDEX MEDICUS

This paper reviews the development and evaluation of a latex particle agglutination test to specifically identify cultured Salmonella enteritidis organisms. The test is based on the use of two monoclonal antibody-coated latex reagents, one of which detects the recently discovered SEF14 fimbriae expressed predominantly by S. enteritidis and S. dublin organisms, while the second reagent detects the H'p' antigen of S. dublin flagella. In a series of field trials 141 out of 142 strains of S. enteritidis from eighteen phage types were correctly identified by the latex test. A further 175 salmonella isolates representing 35 serotypes were tested and only two false-positives (S. dublin) in the latex test were recorded. This is the first rapid serotype specific test for S. enteritidis to be developed, and highlights the potential advantage of fimbrial antigens as novel diagnostic antigens of the future. (13 Refs.)

Descriptors: \*Latex Fixation Tests; \*Salmonella Food Poisoning--microbiology--MI; \*Salmonella enteritidis--isolation and purification--IP; Animals; Humans; Salmonella Food Poisoning--diagnosis--DI; Salmonella enteritidis--classification--CL; Sensitivity and Specificity; Serotyping

Record Date Created: 19940519  
Record Date Completed: 19940519

6/9/28 (Item 28 from file: 155)  
DIALOG(R) File 155:MEDLINE(R)  
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10443679 PMID: 8122348

**Serological detection of chicken flocks naturally infected with Salmonella enteritidis, using an enzyme-linked immunosorbent assay based on monoclonal antibodies against the flagellar antigen.**

van Zijderveld F G; van Zijderveld-van Bemmelen A M; Brouwers R A; de Vries T S; Landman W J; de Jong W A  
Department of Bacteriology, DLO-Central Veterinary Institute, Lelystad, The Netherlands.

Veterinary quarterly (NETHERLANDS) Dec 1993, 15 (4) p135-7, ISSN 0165-2176 Journal Code: 7909485

Publishing Model Print  
Document type: Journal Article  
Languages: ENGLISH  
Main Citation Owner: NLM  
Record type: MEDLINE; Completed  
Subfile: INDEX MEDICUS

The Dutch Salmonella enteritidis monitoring and eradication programme for poultry prescribes a periodic examination of all breeding flocks for the presence of *S. enteritidis*. For the first years of the programme this was done by bacteriological examination of 50 faecal samples per visit per flock. In this study we compare the results of bacteriological examination of faecal samples taken at 1580 visits from 545 flocks with those of a *S. enteritidis* enzyme-linked immunosorbent assay (ELISA) applied on 24 serum samples per visit per flock. Two flocks were found positive for *S. enteritidis* by bacteriological examination; both flocks were also detected by ELISA. Ten flocks, bacteriologically negative for *S. enteritidis* were found positive by ELISA. *S. enteritidis* was isolated from three of these flocks by repeated and extensive bacteriological examination for verification. Verification was not possible in the fourth ELISA positive flock. *S. enteritidis* infections were likely in three other flocks because of the farm histories. On the basis of the results of this study it was decided to use this ELISA, starting from April 1992, as screening technique in the Dutch *S. enteritidis* programme instead of bacteriological examination of faecal samples. The ELISA is regarded as a flock test; an extensive, confirmatory bacteriological investigation for *S. enteritidis* is carried out in ELISA positive flocks to decide whether the flocks are truly infected.

Tags: Comparative Study

Descriptors: \*Antigens, Bacterial--immunology--IM; \*Chickens  
--microbiology--MI; \*Flagella--immunology--IM; \*Poultry Diseases  
--microbiology--MI; \*Salmonella Infections, Animal--diagnosis--DI;  
\*Salmonella enteritidis--immunology--IM; Animals; Antibodies, Bacterial  
--analysis--AN; Antibodies, Monoclonal--analysis--AN; Enzyme-Linked  
Immunosorbent Assay--veterinary--VE; Microbiological Techniques--veterinary  
--VE; Poultry Diseases--diagnosis--DI; Salmonella enteritidis--isolation  
and purification--IP

CAS Registry No.: 0 (Antibodies, Bacterial); 0 (Antibodies,  
Monoclonal); 0 (Antigens, Bacterial)

Record Date Created: 19940404

Record Date Completed: 19940404

6/9/29 (Item 29 from file: 155)

DIALOG(R) File 155:MEDLINE(R)

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10395829 PMID: 7903640

Outer membrane characteristics of *Salmonella enteritidis* phage type 4  
growing in chickens.

Chart H; Conway D; Rowe B

Laboratory of Enteric Pathogens, Central Public Health Laboratory,  
London, UK.

Epidemiology and infection (ENGLAND) Dec 1993, 111 (3) p449-54,  
ISSN 0950-2688 Journal Code: 8703737

Publishing Model Print

Document type: Journal Article

Languages: ENGLISH

Main Citation Owner: NLM

Record type: MEDLINE; Completed

Subfile: INDEX MEDICUS

Strains of *Salmonella enteritidis* belonging to phage type 4 (SE4) were grown in the peritoneal cavities of chickens, and without subculture on laboratory media examined for inducible in vivo phenotypic characteristics. These bacteria expressed three major outer membrane proteins (OMPs) of 33, 35 and 36 kilodaltons (kDa), and iron regulated OMPs of 74, 78 and 81 kDa. Bacteria growing in vivo did not express flagella, or fimbriae with a subunit molecular mass of 14 kDa (14 kDa fimbriae). Two OMPs of 55 and 23 kDa, expressed during culture in nutrient broth, were repressed during growth in chickens. Possession of a 38 MDa 'mouse virulence' plasmid did not influence the expression of OMPs, flagella or fimbriae. It was concluded that strains of SE4 growing in chicken tissues, use an enterobactin mediated iron uptake system to obtain ferric ions, do not express flagella or 14 kDa fimbriae and appear not to express novel OMPs involved in survival in vivo.

Tags: Female

Descriptors: \*Bacterial Outer Membrane Proteins--analysis--AN; \*Chickens --microbiology--MI; \*Salmonella enteritidis--chemistry--CH; Animals; **Antibodies** , Bacterial--blood--BL; Bacteriophage Typing; Cell Membrane --chemistry--CH; Enzyme-Linked Immunosorbent Assay; **Fimbriae** , Bacterial; **Flagella** ; Lipopolysaccharides--immunology--IM; Peritoneal Cavity --microbiology--MI; *Salmonella enteritidis* --classification--CL; *Salmonella enteritidis* --ultrastructure--UL

CAS Registry No.: 0 (Antibodies, Bacterial); 0 (Bacterial Outer Membrane Proteins); 0 (Lipopolysaccharides)

Record Date Created: 19940131

Record Date Completed: 19940131

6/9/30 (Item 30 from file: 155)

DIALOG(R) File 155:MEDLINE(R)

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10316325 PMID: 8104955

**DNA-based diagnostic tests for *Salmonella* species targeting *agfA*, the structural gene for thin, aggregative fimbriae.**

Doran J L; Collinson S K; Burian J; Sarlos G; Todd E C; Munro C K; Kay C M; Baner P A; Peterkin P I; Kay W W

Department of Biochemistry and Microbiology, University of Victoria, British Columbia, Canada.

Journal of clinical microbiology (UNITED STATES) Sep 1993, 31 (9) p2263-73, ISSN 0095-1137 Journal Code: 7505564

Publishing Model Print

Document type: Journal Article

Languages: ENGLISH

Main Citation Owner: NLM

Record type: MEDLINE; Completed

Subfile: INDEX MEDICUS

*Salmonella enteritidis* 27655-3b and a few diarrheagenic *Escherichia coli* strains produce morphologically and antigenically related, thin, aggregative **fimbriae** , collectively named GVVPQ **fimbriae** (S. K. Collinson, L. Emody, T. J. Trust, and W. W. Kay, J. Bacteriol. 174:4490-4495, 1992). To determine whether GVVPQ **fimbriae** are common to *Salmonella* spp. and other enteropathogenic members of the family Enterobacteriaceae, 113 isolates were phenotypically screened for Congo red binding and aggregative colony morphology. Presumptive positive and representative negative strains were examined by Western blotting (immunoblotting) by using antiserum to SEF 17, the native GVVPQ **fimbria**

of *S. enteritidis*. Only four *S. enteritidis* strains and six *E. coli* isolates possessed substantial amounts of GVVPQ fimbriae after 24 h of incubation on T medium. Following 5 days of incubation, 56 of 93 *Salmonella* isolates (60%) and 1 of 7 additional *E. coli* clinical isolates possessed detectable levels of GVVPQ fimbriae. Since variable expression of GVVPQ fimbriae was observed among *Salmonella* isolates and some *E. coli* strains produced scant amounts, as revealed by immunoelectron microscopy, the ability to produce these fimbriae was evaluated by genotypic screening. The structural gene for the SEF 17 fimbrin, *agfA*, was amplified by the polymerase chain reaction, cloned, and sequenced to provide a characterized DNA probe. An *agfA* DNA fragment hybridized strongly to 603 of 604 (99.8%) *Salmonella* isolates but very weakly to 31 of 266 other members of the family Enterobacteriaceae including 26 of 137 *E. coli* strains, 3 of 14 *Citrobacter* spp., and single isolates of *Shigella sonnei* and *Enterobacter cloacae*. The *agfA* DNA probe proved to be a valuable diagnostic tool for *Salmonella* isolates arrayed on hydrophobic grid membrane filters. Unique *agfA* sequences were targeted in the development of a polymerase chain reaction assay specific for *Salmonella* spp.

Tags: Research Support, Non-U.S. Gov't

Descriptors: \*DNA Probes; \*Fimbriae, Bacterial; \*Genes, Structural, Bacterial; \**Salmonella*--genetics--GE; Amino Acid Sequence; Base Sequence; Humans; Molecular Sequence Data; Polymerase Chain Reaction; *Salmonella*--isolation and purification--IP; *Salmonella* Infections--diagnosis--DI

CAS Registry No.: 0 (DNA Probes)

Gene Symbol: *agfA*

Record Date Created: 19931102

Record Date Completed: 19931102

6/9/31 (Item 31 from file: 155)

DIALOG(R) File 155:MEDLINE(R)

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10289260 PMID: 8371111

Cloning, DNA nucleotide sequence and distribution of the gene encoding the SEF14 fimbrial antigen of *Salmonella enteritidis*.

Turcotte C; Woodward M J

Molecular Genetics Unit, Central Veterinary Laboratory, Addlestone (Weybridge), Surrey, UK.

Journal of general microbiology (ENGLAND) Jul 1993, 139 ( Pt 7) p1477-85, ISSN 0022-1287 Journal Code: 0375371

Publishing Model Print

Document type: Journal Article

Languages: ENGLISH

Main Citation Owner: NLM

Record type: MEDLINE; Completed

Subfile: INDEX MEDICUS

Monoclonal antibody 69/25, specific for the *Salmonella enteritidis* fimbrial antigen (SEF14), was used to screen a pUC-based *S. enteritidis* gene library and a positive clone was identified. Subcloning experiments demonstrated that a 584 bp *DraI* DNA fragment was the minimal chromosomal segment capable of directing SEF14 antigen expression. Western blotting of *Escherichia coli* recombinants identified a gene product of M(r) 16000 as a precursor to the M(r) 14300 mature fimbrial subunit protein. The DNA nucleotide sequence of the *DraI* fragment was determined and was shown to contain a single open reading frame with two potential f-Met start codons and a hydrophobic signal sequence. Downstream of a putative peptidase cleavage site, the deduced amino acid sequence showed considerable homology with the N-terminal amino acid sequence of what was originally described as

the type 1 **fimbrial** subunit of *Salmonella enteritidis* and later redefined as SEF14. The gene encoding SEF14, designated as *sefA*, was shown to be limited in distribution to *Salmonella blegdam*, *S. dublin*, *S. enteritidis*, *S. gallinarum*, *S. moscow*, *S. pullorum*, *S. rostock*, *S. seremban* and *S. typhi*, all belonging to *Salmonella* group D. However, expression of the SEF14 antigen was limited to *S. dublin*, *S. enteritidis*, *S. moscow* and *S. blegdam*. The nucleotide sequence of the *sefA* gene shared no homology with the *Salmonella fimbA* gene encoding type 1 **fimbriae**, and these genes showed distinct patterns of distribution within salmonellae.

Tags: Comparative Study

Descriptors: \*Antigens, Bacterial--genetics--GE; \*Bacterial Proteins --genetics--GE; \*Fimbriae Proteins; \*Genes, Structural, Bacterial--genetics --GE; \**Salmonella enteritidis*--genetics--GE; Amino Acid Sequence; Antibodies, Monoclonal; Base Sequence; Cloning, Molecular; Conserved Sequence; Gene Expression; Gene Library; Molecular Sequence Data; Regulatory Sequences, Nucleic Acid--genetics--GE; *Salmonella typhimurium* --genetics--GE; Sequence Alignment; Sequence Analysis, DNA; Sequence Homology, Nucleic Acid; Species Specificity

Molecular Sequence Databank No.: GENBANK/L03833

CAS Registry No.: 0 (Antibodies, Monoclonal); 0 (Antigens, Bacterial); 0 (Bacterial Proteins); 0 (*fimbrillin*); 0 (*sefA* protein, *Salmonella enteritidis*); 147680-16-8 (Fimbriae Proteins)

Gene Symbol: *sefA*

Record Date Created: 19931008

Record Date Completed: 19931008

6/9/52 (Item 4 from file: 5)

DIALOG(R) File 5: Biosis Previews(R)

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0011380645 BIOSIS NO.: 199800174892

Characterisation of epitopes of type 1 **fimbriae** of *Salmonella* using monoclonal antibodies specific for SEF21 **fimbriae** of *Salmonella enteritidis*

AUTHOR: Sojka Marcjanna G; Carter Michelle A; Thorns Christopher J (Reprint)

AUTHOR ADDRESS: Dep. Bacteriol., Cent. Vet. Lab., New Haw, Addlestone, Surrey KT15 3NB, UK\*\*UK

JOURNAL: Veterinary Microbiology 59 (2-3): p157-174 Jan. 16, 1998 1998

MEDIUM: print

ISSN: 0378-1135

DOCUMENT TYPE: Article

RECORD TYPE: Abstract

LANGUAGE: English

ABSTRACT: Monoclonal **antibodies** (mAbs) were used to identify and characterise epitopes of type 1 (SEF21) **fimbriae** of *Salmonella enteritidis*. The distribution of the epitopes among salmonellas and other enterobacteria was investigated, as well as the influence of growth media and temperatures on their expression. At least four different epitope clusters were identified on SEF21 **fimbriae** of *S. enteritidis*. Two of these clusters were associated with **fimbrial** haemagglutinins that were either common to all salmonellae tested, or restricted only to *S. enteritidis* and *S. dublin*. The four epitope clusters were identified on type 1 **fimbriae** of most *Salmonella* serotypes, as well as non-haemagglutinating type 2 **fimbriae** of *S. pullorum* and *S. gallinarum*, and on many other enterobacterial species. The expression of the epitopes

was affected by growth conditions.

DESCRIPTORS:

MAJOR CONCEPTS: Biochemistry and Molecular Biophysics

BIOSYSTEMATIC NAMES: Enterobacteriaceae--Facultatively Anaerobic

Gram-Negative Rods, Eubacteria, Bacteria, Microorganisms

ORGANISMS: Salmonella-dublin (Enterobacteriaceae); Salmonella-enteritidis (Enterobacteriaceae); Salmonella-gallinarum (Enterobacteriaceae);

Salmonella-pullorum (Enterobacteriaceae)

ORGANISMS: PARTS ETC: SEF21 fimbriae

COMMON TAXONOMIC TERMS: Bacteria; Eubacteria; Microorganisms

CHEMICALS & BIOCHEMICALS: monoclonal antibodies

MISCELLANEOUS TERMS: epitope characterization

CONCEPT CODES:

30000 Bacteriology, general and systematic

10060 Biochemistry studies - General

BIOSYSTEMATIC CODES:

06702 Enterobacteriaceae

6/9/53 (Item 5 from file: 5)

DIALOG(R) File 5:Biosis Previews(R)

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0010029798 BIOSIS NO.: 199598497631

**Rapid detection of Salmonella enteritidis in pooled liquid egg samples using a magnetic bead-ELISA system**

AUTHOR: Holt Peter S; Gast Richard K; Greene Cam R

AUTHOR ADDRESS: U.S. Dep. Agric., Agric. Res. Serv., Southeast Poult. Res. Lab., Athens, GA 30605, USA\*\*USA

JOURNAL: Journal of Food Protection 58 (9): p967-972 1995 1995

ISSN: 0362-028X

DOCUMENT TYPE: Article

RECORD TYPE: Abstract

LANGUAGE: English

ABSTRACT: An assay was developed to shorten the time necessary to detect *Salmonella enteritidis* (SE) in contaminated egg pools. The immunomagnetic separation (IMS)-based assay used the Dynabeads<sup>TM</sup> Anti-Salmonella, a magnetic bead with mouse anti-Salmonella antibodies affixed to the surface, to bind the SE in the egg pools. The bound SE were concentrated by a magnet and were detected via an enzyme-linked immunosorbent assay (ELISA) (IMS-ELISA) employing a monoclonal anti-SE flagellar proteins (flagellins) antibody. Following the ELISA, the beads were plated onto differential media (IMS-direct). The efficacy of the assay for detecting SE was compared with that of the standard assay, direct plating, in pooled egg samples spiked with low concentrations of SE and incubated at 37 degree C for 24 to 96 h. Conventional direct plating of egg samples required a total of 48 h before SE could be identified in egg pools, compared with 24 h for the IMS-ELISA. Plating of the beads (IMS-direct) to confirm the presence of SE required a further 24 h. The IMS-ELISA could detect SE at concentrations of 10<sup>-5</sup> to 10<sup>-6</sup> SE cells per ml, comparable to that shown previously for direct plating. The IMS-direct could detect SE at 10<sup>-4</sup> SE cells per ml of egg pool. In egg pools initially contaminated with 10 SE cells per ml, the organism grew to levels by 24 h at 37 degree C where 100% of the pools were positive for SE by all three detection methods. In egg pools initially contaminated with 1 SE cell per ml, 61% of pools were detected by direct plating and IMS-ELISA and 72% were detected by IMS-direct. Similar

detection frequencies were observed for a second SE isolate. The IMS-ELISA provides an SE detection rate comparable to direct plating but achieves the result 24 h sooner. The IMS-direct was the most sensitive means of detecting the SE.

DESCRIPTORS:

MAJOR CONCEPTS: Biochemistry and Molecular Biophysics; Cell Biology; Foods; Infection; Methods and Techniques; Physiology; Public Health-- Allied Medical Sciences; Toxicology; Vector Biology  
BIOSYSTEMATIC NAMES: Bacteria--Microorganisms; Enterobacteriaceae-- Facultatively Anaerobic Gram-Negative Rods, Eubacteria, Bacteria, Microorganisms; Microorganisms--Microorganisms  
ORGANISMS: bacteria (Bacteria); Salmonella enteritidis (Enterobacteriaceae); microorganism (Microorganisms)  
COMMON TAXONOMIC TERMS: Bacteria; Eubacteria; Microorganisms  
MISCELLANEOUS TERMS: poultry industry; ANALYTICAL METHOD; DETECTION METHODS; DIRECT PLATING; FOOD CONTAMINATION; FOOD PRODUCTS; HUMAN FOOD POISONING

CONCEPT CODES:

01004 Methods - Laboratory methods  
01006 Methods - Laboratory apparatus  
10010 Comparative biochemistry  
10054 Biochemistry methods - Proteins, peptides and amino acids  
10064 Biochemistry studies - Proteins, peptides and amino acids  
10068 Biochemistry studies - Carbohydrates  
10504 Biophysics - Methods and techniques  
10506 Biophysics - Molecular properties and macromolecules  
10508 Biophysics - Membrane phenomena  
10610 External effects - Electric, magnetic and gravitational phenomena  
10618 External effects - Temperature as a primary variable - hot  
13520 Food technology - Poultry and eggs  
13530 Food technology - Evaluations of physical and chemical properties  
13532 Food technology - Preparation, processing and storage  
22502 Toxicology - Foods, food residues, additives and preservatives  
30500 Morphology and cytology of bacteria  
31000 Physiology and biochemistry of bacteria  
32000 Microbiological apparatus, methods and media  
34502 Immunology - General and methods  
34504 Immunology - Bacterial, viral and fungal  
36001 Medical and clinical microbiology - General and methods  
36002 Medical and clinical microbiology - Bacteriology  
37006 Public health - Public health laboratory methods  
37060 Public health: disease vectors - Inanimate  
37400 Public health: microbiology - Public health microbiology  
39002 Food microbiology - Food and beverage spoilage and contamination

BIOSYSTEMATIC CODES:

05000 Bacteria  
06702 Enterobacteriaceae  
01000 Microorganisms

? logoff hold

06jul05 09:31:44 User228206 Session D2460.4  
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\$0.20 0.033 DialUnits File5  
\$4.00 2 Type(s) in Format 9  
\$4.00 2 Types  
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       \$0.03     0.011 DialUnits File10  
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       \$0.07     0.011 DialUnits File654  
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       \$0.03,    0.011 DialUnits File143  
 \$0.03 Estimated cost File143  
       \$0.06     0.011 DialUnits File16  
 \$0.06 Estimated cost File16  
       \$0.23     0.011 DialUnits File357  
 \$0.23 Estimated cost File357  
       \$0.04     0.011 DialUnits File94  
 \$0.04 Estimated cost File94  
       \$0.05     0.011 DialUnits File98  
 \$0.05 Estimated cost File98  
       \$0.19     0.011 DialUnits File340  
 \$0.19 Estimated cost File340  
       \$0.04     0.011 DialUnits File65  
 \$0.04 Estimated cost File65  
       OneSearch, 18 files, 0.474 DialUnits FileOS  
 \$0.26 TELNET  
 \$13.11 Estimated cost this search  
 \$13.11 Estimated total session cost   0.474 DialUnits

Logoff: level 05.05.00 D 09:31:44

Set Items Description

Cost is in DialUnits

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Terminal set to DLINK

? t s6/9/55 59 61 77 79 88 90 91 97 102

>>>Null command ignored

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6/9/55 (Item 7 from file: 5)

DIALOG(R)File 5:Biosis Previews(R)

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0009531624 BIOSIS NO.: 199497552909

**A rapid immunoblotting procedure for detecting serum antibodies to  
Salmonella enteritidis**

AUTHOR: Chart Henrik (Reprint); Waghorn D J; Rowe B

AUTHOR ADDRESS: Lab. Enteric Pathogens, Central Public Health Lab., 61  
Colindale Ave., London NW9 5HT, UK\*\*UK

JOURNAL: Letters in Applied Microbiology 19 (3): p177-178 1994 1994

ISSN: 0266-8254

DOCUMENT TYPE: Article

RECORD TYPE: Abstract

LANGUAGE: English

ABSTRACT: An immunoblotting method, which can be completed in 1 d, is  
described for the detection of human serum **antibodies** to *Salmonella*  
**enteritidis** lipopolysaccharide and **flagella** .

DESCRIPTORS:

MAJOR CONCEPTS: Biochemistry and Molecular Biophysics; Blood and  
Lymphatics--Transport and Circulation; Immune System--Chemical  
Coordination and Homeostasis; Infection; Toxicology

BIOSYSTEMATIC NAMES: Enterobacteriaceae--Facultatively Anaerobic  
Gram-Negative Rods, Eubacteria, Bacteria, Microorganisms; Hominidae--  
Primates, Mammalia, Vertebrata, Chordata, Animalia

ORGANISMS: *Salmonella enteritidis* (Enterobacteriaceae); human (Hominidae)

COMMON TAXONOMIC TERMS: Bacteria; Eubacteria; Microorganisms; Animals;  
Chordates; Humans; Mammals; Primates; Vertebrates

MISCELLANEOUS TERMS: ANALYTICAL METHOD; ENDOTOXIN; IMMUNOLOGIC METHOD;  
LIPOPOLYSACCHARIDE

CONCEPT CODES:

10054 Biochemistry methods - Proteins, peptides and amino acids

10058 Biochemistry methods - Carbohydrates

10064 Biochemistry studies - Proteins, peptides and amino acids

10066 Biochemistry studies - Lipids

10068 Biochemistry studies - Carbohydrates

15002 Blood - Blood and lymph studies

22501 Toxicology - General and methods

31000 Physiology and biochemistry of bacteria

34502 Immunology - General and methods

34504 Immunology - Bacterial, viral and fungal

36002 Medical and clinical microbiology - Bacteriology

BIOSYSTEMATIC CODES:

06702 Enterobacteriaceae

86215 Hominidae

6/9/59 (Item 11 from file: 5)

DIALOG(R) File 5: Biosis Previews(R)  
(c) 2005 BIOSIS. All rts. reserv.

0002088374 BIOSIS NO.: 197763009230

**SEROLOGIC IDENTIFICATION OF SALMONELLA**

AUTHOR: GRADOS B O; GREVE U E

JOURNAL: Boletin del Instituto Bacteriologico de Chile 17 (1-2): p3-11  
1975

DOCUMENT TYPE: Article

RECORD TYPE: Abstract

LANGUAGE: Unspecified

**ABSTRACT:** Detailed laboratory procedures for the diagnosis of Salmonella spp. and the serological identification of individual types and strains are reviewed, including the preparation of O (somatic) antigen, the use of polyvalent and Vi **antisera**, the use of group **antisera** and O factors. Individual attention is given to the identification of **flagellar** (H) antigens and the use of 1st and 2nd phase **flagellar antisera**, and factor H **antisera**. S. cholerae-suis, S. typhi and S. enteritidis are of the most common interest. A list of the more common 49 types are supplied. The slide agglutination technique is suggested for the determination of somatic antigens; the tube agglutination technique is recommended for **flagellar** antigen determination. The centralization of serotyping services is advocated for Salmonella identification and other purposes.

**DESCRIPTORS:** SALMONELLA-TYPHI SALMONELLA-CHOLERA-SUIS  
SALMONELLA-ENTERITIDIS SALMONELLA-SPP O ANTIGEN H ANTIGEN VI ANTIGEN TUBE  
AGGLUTINATION SLIDE AGGLUTINATION SEROTYPING SERVICE CENTRALIZATION  
**DESCRIPTORS:**

MAJOR CONCEPTS: Immune System--Chemical Coordination and Homeostasis;  
Infection; Public Health--Allied Medical Sciences; Serology--Allied  
Medical Sciences

BIOSYSTEMATIC NAMES: Bacteria--Microorganisms

COMMON TAXONOMIC TERMS: Bacteria; Eubacteria; Microorganisms

**CONCEPT CODES:**

10064 Biochemistry studies - Proteins, peptides and amino acids  
10066 Biochemistry studies - Lipids  
10068 Biochemistry studies - Carbohydrates  
12504 Pathology - Diagnostic  
15002 Blood - Blood and lymph studies  
30500 Morphology and cytology of bacteria  
31000 Physiology and biochemistry of bacteria  
34502 Immunology - General and methods  
34504 Immunology - Bacterial, viral and fungal  
36001 Medical and clinical microbiology - General and methods  
36002 Medical and clinical microbiology - Bacteriology  
36504 Medical and clinical microbiology - Serodiagnosis  
37006 Public health - Public health laboratory methods  
37400 Public health: microbiology - Public health microbiology

**BIOSYSTEMATIC CODES:**

05000 Bacteria

6/9/61 (Item 1 from file: 73)

DIALOG(R) File 73: EMBASE

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07098920 EMBASE No: 1997380784

**Serological response of patients infected with Salmonella typhi**

Chart H.; Rowe B.; Cheesbrough J.S.

Dr. H. Chart, Laboratory of Enteric Pathogens, Central Public Health  
Laboratory, 61 Colindale Avenue, London NW9 5HT United Kingdom

Journal of Clinical Pathology ( J. CLIN. PATHOL. ) (United Kingdom) 1997  
50/11 (944-946)

CODEN: JCPAA ISSN: 0021-9746

DOCUMENT TYPE: Journal; Article

LANGUAGE: ENGLISH SUMMARY LANGUAGE: ENGLISH

NUMBER OF REFERENCES: 10

Aims - To evaluate a rapid immunoblotting procedure for providing evidence of infection with Salmonella typhi using 73 sera from patients infected with S typhi. Methods - A sodium dodecyl sulphate-polyacrylamide gel electrophoresis (SDS-PAGE)/immunoblotting procedure using lipopolysaccharide (LPS, O=9,12) and flagellar (H=d) antigens was used. Results - Seventy two of 73 sera contained antibodies to LPS, 40 sera also contained antibodies to H=d flagellar antigens. Analysis of acute and convalescent sera showed that only 62% of patients produced antibodies to flagellar antigens. Conclusions - The SDS-PAGE/immunoblotting procedure provided a rapid method for providing serological evidence of infection with S typhi.

**DRUG DESCRIPTORS:**

\*bacterial antigen; \*bacterium antibody--endogenous compound--ec; \*  
bacterium lipopolysaccharide  
dodecyl sulfate sodium

**MEDICAL DESCRIPTORS:**

\*salmonella typhi; \*salmonellosis  
adult; **antibody** response; article; clinical article; controlled study;  
female; **flagellum** ; human; human tissue; immunoblotting; male;  
polyacrylamide gel electrophoresis; priority journal; salmonella  
**enteritidis** ; serology

CAS REGISTRY NO.: 151-21-3 (dodecyl sulfate sodium)

**SECTION HEADINGS:**

- 004 Microbiology: Bacteriology, Mycology, Parasitology and Virology
- 005 General Pathology and Pathological Anatomy
- 026 Immunology, Serology and Transplantation

6/9/77 (Item 1 from file: 10)

DIALOG(R)File 10:AGRICOLA

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3600531 10830473 Holding Library: DNLN/DLC; DLC; NLM; SQU; DAY; AGL  
**Mechanisms in the pathogenesis of enteric diseases / edited by Prem S.  
Paul, David H. Francis, and David A. Benfield**

Paul, Prem S.; Francis, David H.; Benfield, David A.

International Rushmore Conference on Mechanisms in the Pathogenesis of  
Enteric Diseases (1st : 1995 : Rapid City, S.D.)

New York : Plenum Press, c1997.

xii, 439 p. : ill. ; 26 cm.

Advances in experimental medicine and biology, v. 412

LCCN: 97005561

ISBN: 0306455196

DNAL CALL NO: QP901.A33 v.412

Language: English

"Proceedings of the First International Rushmore Conference on Mechanisms  
in the Pathogenesis of Enteric Diseases, held September 28-30, 1995, in

Rapid City, South Dakota"--T.p. verso.

Includes bibliographical references and index.

Contents: Comparative histopathology of intestinal infections -- Neuro-immune pathobiology of infectious enteric disease -- Application of intestinal xenografts to the study of enteropathogenic infectious disease -- An overview of immunological and genetic methods for detecting swine coronavirus, transmissible gastroenteritis virus, and porcine respiratory coronavirus in tissues -- Pathogenesis of O157:H7 Escherichia coli infection in neonatal calves -- Variation in virulence in the gnotobiotic pig model of O127:H7 Escherichia coli strains of bovine and human origin -- Attaching and effacing E.coli: microscopic and ultrastructural observations of intestinal infections in pigs -- Dynamics of Clostridium difficile infection: control using diet -- Detection and differentiation of 3 K88 serogroups using polymerase chain reaction techniques: K88 serogroup detection and differentiation -- Specific identification of Escherichia coli O157:H7 using a multiplex PCR assay -- Variation in manifestation of E. coli H7 antigen -- Verotoxigenic Escherichia coli in slaughter cattle and ground beef in South Dakota -- Immunoglobulin response to Salmonella enteritidis outer membrane proteins: use for evaluating infectious status -- Sequence analysis of VP7 gene of a bovine rotavirus with G6 subtype -- Detection of the fimbrial gene F18(F107) from swine enteritis Escherichia coli -- A chick model for the study of "attaching and effacing Escherichia coli" infection -- Immunological cross reactivity of EAEA(Intimin) from E.coli that cause attaching and effacing lesions in humans and rabbits.

Place of Publication: New York

Subfile: OTHER US (NOT EXP STN, EXT, USDA; SINCE 12/76); 1;

Document Type: Monograph; Bibliographies

DESCRIPTORS: Infection; Communicable diseases;

Section Headings: L830 ANIMAL DISEASES-GENERAL; X380 HUMAN MEDICINE

6/9/79 (Item 3 from file: 10)

DIALOG(R) File 10:AGRICOLA

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3251109 93003479 Holding Library: AGL

Comparison of four different enzyme-linked immunosorbent assays for serological diagnosis of Salmonella enteritidis infections in experimentally infected chickens

Zijderfeld, F.G. van Zijderfeld-van Bemmelen, A.K. van; Anakotta, J.

DLO-Central Veterinary Institute, Lelystad, The Netherlands

Washington, D.C. : American Society for Microbiology.

Journal of clinical microbiology. Oct 1992. v. 30 (10) p. 2560-2566.

ISSN: 0095-1137 CODEN: JCMIDW

DNAL CALL NO: QR46.J6

Language: English

Includes references.

Subfile: OTHER US (NOT EXP STN, EXT, USDA; SINCE 12/76);

Document Type: Article

The program for the eradication of Salmonella enteritidis from chickens in The Netherlands is based on bacteriological examination of breeding flocks. There is a great need for a specific and sensitive serological screening test. For that purpose, we developed four different enzyme-linked immunosorbent assays (ELISAs), i.e., an indirect ELISA with S. enteritidis flagellin, an indirect ELISA with S. enteritidis lipopolysaccharide, a double-antibody sandwich blocking ELISA that uses monoclonal antibodies against S. enteritidis flagellin (GM-DAS blocking ELISA), and a double-antibody sandwich ELISA that uses monoclonal antibodies against

*S. enteritidis* lipopolysaccharide. In the present study, we compare the results of those ELISAs with sera from experimentally infected 1-day-old chickens and with sera and eggs from experimentally infected laying hens. Experimental infections were induced with strains of *S. enteritidis* phage types 1 and 2, *S. typhimurium*, and *S. panama*. Sera were collected up to days 44 and 39 after infection from 1-day-old chickens and laying hens, respectively. Only the GM-DAS blocking ELISA was able to discriminate between *S. enteritidis* infections and infections with the other serotypes. This ELISA had both a sensitivity and a specificity of 100% for all serum samples from experimentally infected chickens. A field study is in progress to evaluate whether this test can be implemented in the Dutch *S. enteritidis* eradication program.

DESCRIPTORS: fowls; salmonella enteritidis; serum; ova; experimental infections; immunodiagnosis; elisa;

Identifiers: indirect elisa; double-antibody sandwich elisa; double-antibody sandwich blocking elisa

Section Headings: L832 ANIMAL DISEASES-BACTERIAL

6/9/88 (Item 3 from file: 35)

DIALOG(R) File 35:Dissertation Abs Online

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01520121 ORDER NO: AAD96-38280

**STUDIES ON THE MECHANISM OF TRANSOVARIAN TRANSMISSION OF SALMONELLA ENTERITIDIS IN LAYING HENS (EGG CONTAMINATION)**

Author: THIAGARAJAN, DORAIRAJAN

Degree: PH.D.

Year: 1995

Corporate Source/Institution: PURDUE UNIVERSITY (0183)

Major Professors: A. M. SAEED; H. L. THAKER

Source: VOLUME 57/07-B OF DISSERTATION ABSTRACTS INTERNATIONAL.

PAGE 4188. 193 PAGES

Descriptors: BIOLOGY, MICROBIOLOGY ; AGRICULTURE, FOOD SCIENCE AND TECHNOLOGY ; AGRICULTURE, ANIMAL CULTURE AND NUTRITION

Descriptor Codes: 0410; 0359; 0475

Food poisoning caused by *Salmonella enteritidis* following consumption of contaminated shell eggs is a major public health concern. Epidemiological and microbiological investigations indicated that in vivo contamination of the egg occurs in the reproductive tract of the laying hen. The present study was conducted to understand the contamination of yolk prior to ovulation. After oral inoculations of 140 laying hens with *S. enteritidis*, the organism was isolated from the preovulatory follicles in 16 birds (from follicle membrane alone in 10 birds, from the follicle yolk alone in four birds and from both membrane and yolk in two birds). This suggested that *S. enteritidis* interacted with cellular component(s) in the follicular wall. Chicken ovarian granulosa cells, a component of the follicular wall, were cultured in vitro and were used to demonstrate three different patterns of *S. enteritidis* attachment to these cells namely, local, diffuse, and aggregative. In addition, *S. enteritidis* can invade the granulosa cells in vitro and multiply in the cytoplasm. Preincubation of bacteria with the tetrapeptide arginine-glycine-aspartate-serine, the amino acid sequence known to mediate the interaction of adhesive glycoproteins with cells, inhibited in vitro attachment of bacteria to granulosa cells. Preincubation of granulosa cells with anti-chicken fibronectin serum or a purified 14 kilodalton fimbrial protein inhibited bacterial attachment to granulosa cells in vitro. Laying hens were orally

inoculated with two strains of *S. enteritidis* with different **fimbrial** proteins (21 kilodalton and 14 kilodalton) and one strain without **fimbriae**. Decreased cecal colonization and fecal shedding of the organism were observed in hens that were inoculated with the strain that did not express surface **fimbriae** compared to birds inoculated with other two strains ( $P < .05$ ). Mean serum **antibody** titers of birds inoculated with this strain were also lower than titers of hens inoculated with the other two strains. Immunoblot of bacterial outer membrane structures revealed **antibodies** against major membrane associated proteins, 14 kilodalton **fimbriae** and lipopolysaccharide. **Fimbrial** proteins may mediate attachment of *S. enteritidis* to cecal epithelium and are able to elicit serum **antibodies** after oral inoculation.

6/9/90 (Item 1 from file: 203)

DIALOG(R) File 203:AGRIS

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02538478 AGRIS No: 2003-026468

**Simplified preparation of a specific Salmonella enteritidis antigen for ELISA [enzyme linked immuno sorbent assay] and other immunological techniques**

Zamora, B.M. (Tropical Biological Phils., Inc., 92 Matatag St., Diliman, Quezon City (Philippines)) Hartung, M.; Hildebrandt, G.; Kaesbohrer, A.  
Conference Title: 27. Annual Convention of the Philippine Society for Microbiology, Inc.

Conference Location and Year: Manila (Philippines), 7-8 May 1998

**Proceedings of the 27th Annual Convention of the Philippine Society for Microbiology, Inc.**

Philippine Society for Microbiology, Inc., c/o De La Salle Univ. Taft Ave., Manila (Philippines)

Publisher: , Manila (Philippines), 1998, 274 p., p. 92-101

Notes: Received Jun 2002

Notes: 1 ill.; 3 tables; 19 ref.

Language: English Summary Language: English

Place of Publication: Philippines

Availability: Philippines Center

Document Type: Analytic, Monograph, Summary, Conference,  
Nonconventional Literature

Journal Announcement: 2909 Record input by Philippines

A specific *Salmonella enteritidis* antigen preparation consisting of **fimbrial** and **flagellar** fractions was produced using a simple preparation and separation techniques. The applied purification techniques were filtration and concentration. The presence of the **fimbrial** fraction SEF14 in the antigen preparation was demonstrated primarily with the help of a latex agglutination test (SEFEX\*\*R). This fraction was seen in immunoblots as a 14KD-band which related positively with sera from bacteriologically *S. enteritidis* -positive flocks and negatively with sera from bacteriologically *S. enteritidis* -negative and *S. typhimurium*-positive flocks. The same immunological reaction was shown by the **flagellar** fraction, which was seen as a wide protein band in the area between 54 and 56 KD. This fraction was further identified as H:g by testing the antigen with **antisera** against H:g and H:m-carrying serovars in the indirect ELISA. Strong reactions with H:g-carrying serovars *S. enteritidis* and *S. sueldorf* were detected, while no reaction could be demonstrated with closely related serovars *S. typhimurium* and *S. gallinarum-pullorum*. Consequently, the prepared FG-antigen was applied in

succeeding studies on the serological detection of *S. enteritidis* infections in broilers using the indirect ELISA and chemiluminescent immunoassay (CLIA).

Descriptors in English: \*BROILER CHICKENS; \*SALMONELLA ENTERITIDIS; \*ELISA; \*ANTIGENS; BACTERIA; BIRDS; CHICKENS; DOMESTIC ANIMALS; ENTEROBACTERIACEAE; GALLIFORMES; IMMUNOENZYME TECHNIQUES; IMMUNOLOGICAL FACTORS; IMMUNOLOGICAL TECHNIQUES; LIVESTOCK; MEAT ANIMALS; POULTRY; SALMONELLA; USEFUL ANIMALS;

Descriptors in Spanish: \*POLLO DE ENGORDE; \*SALMONELLA ENTERITIDIS; \*ELISA; \*ANTIGENOS; ANIMALES DE CARNE; ANIMALES DOMESTICOS; ANIMALES UTILES; AVES DE CORRAL; BACTERIA; ENTEROBACTERIACEAE; FACTORES INMUNOLOGICOS; GALLIFORMES; GANADO; PAJAROS; POLLO; SALMONELLA; TECNICAS INMUNOENZIMATICAS; TECNICAS INMUNOLOGICAS;

Descriptors in French: \*POULET DE CHAIR; \*SALMONELLA ENTERITIDIS; \*TEST ELISA; \*ANTIGENE; ANIMAL A VIANDE; ANIMAL DOMESTIQUE; ANIMAL UTILE; BACTERIA; BETAIL; ENTEROBACTERIACEAE; FACTEUR IMMUNOLOGIQUE; GALLIFORMES; OISEAU; POULET; SALMONELLA; TECHNIQUE IMMUNOENZYMATIQUE; TECHNIQUE IMMUNOLOGIQUE; VOLAILLE;

Section Headings: Q02 (FOOD SCIENCE -- Food processing and preservation)

6/9/91 (Item 2 from file: 203)

DIALOG(R) File 203:AGRIS

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02241280 AGRIS No: 1998-053483

Characterisation of epitopes of type 1 fimbriae of *Salmonella* using monoclonal antibodies specific for SEF21 fimbriae of *Salmonella enteritidis*

Thorns, C.J. (Central Veterinary Lab., New Haw, Addlestone, Surrey (United Kingdom). Dept. of Bacteriology); Sojka, M.G.; Carter, M.A.

Journal: Veterinary Microbiology, Jan 1998, v. 59(2-3) p. 157-174

Notes: 43 ref. ISSN: 0378-1135

Language: English Summary Language: English

Place of Publication: Netherlands

Document Type: Journal Article, Summary

Journal Announcement: 2406 Record input by Netherlands

Descriptors in English: \*SALMONELLA ENTERITIDIS; \*MONOCLONAL ANTIBODIES; \*ANTIGENS; \*CULTURE MEDIA; \*TEMPERATURE; ANTIBODIES; BACTERIA; ENTEROBACTERIACEAE; IMMUNOLOGICAL FACTORS; SALMONELLA;

Descriptors in Spanish: \*SALMONELLA ENTERITIDIS; \*ANTICUERPOS MONOCLONALES; \*ANTIGENOS; \*MEDIO DE CULTIVO; \*TEMPERATURA; ANTICUERPOS; BACTERIA; ENTEROBACTERIACEAE; FACTORES INMUNOLOGICOS; SALMONELLA;

Descriptors in French: \*SALMONELLA ENTERITIDIS; \*ANTICORPS MONOCLONAL; \*ANTIGENE; \*MILIEU DE CULTURE; \*TEMPERATURE; ANTICORPS; BACTERIA; ENTEROBACTERIACEAE; FACTEUR IMMUNOLOGIQUE; SALMONELLA;

Section Headings: L73 (ANIMAL PRODUCTION -- Animal diseases)

6/9/97 (Item 1 from file: 16)

DIALOG(R) File 16:Gale Group PROMT(R)

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04084158 Supplier Number: 45949166 (THIS IS THE FULLTEXT)  
COLORIMETRIC PROBE ASSAY FOR DETECTION OF SALMONELLA ASSESSED

Food Chemical News, v37, n39, pN/A  
Nov 20, 1995  
ISSN: 0015-6337  
Language: English Record Type: Fulltext  
Document Type: Newsletter; Trade  
Word Count: 620

TEXT:

The overall sensitivity of the GENE-TRAK colorimetric probe assay for the detection of foodborne Salmonella spp. was 90.7% and the specificity was 100%, according to a performance assessment using pure cultures and naturally contaminated foods and animal feed.

J. D'Aoust and colleagues, Food Directorate, Health Protection Branch, Health Canada, Ottawa, Canada, and GENE- TRAK Systems Industrial Diagnostics, Framingham, Mass., reported in the October 1995 issue of the Journal of Food Protection that the probe effectively identified 110 strains of Salmonella spp. and yielded no false-positive reactions in the examination of 61 pure cultures of nonsalmonellae.

Of the 53 contaminated raw meats and other high-moisture samples examined, 47 (88.7%) were detected using the GENE- TRAK analytical protocol, according to their report.

Ancillary work showed that the choice of selective enrichment conditions played a determinant role in the performance of the probe system, and attempts to shorten the method time through probing of 6- and 24-hour selective enrichment cultures met with limited success, the researchers stated.

The researchers are now investigating the feasibility of enhancing the performance of the system "to a level of unfailing sensitivity and specificity" by probing an equal mixture of post-enrichment (6 hour) cultures arising from homologous tetrathionate brilliant green and selenite cystine 24-hour cultures, according to the report.

Charm Farm Test for Antimicrobial Residues in Meat Evaluated

In the same issue, Gary Korsrud and colleagues, Health of Animals Laboratory, Agriculture and Agri-Food Canada, Saskatoon, Canada, reported on their laboratory evaluation of a commercial test kit for detecting antimicrobial residues in tissues, the Charm Farm Test manufactured by Charm Sciences Inc. in Malden, Mass.

The researchers found that the Charm Farm Test is relatively easy to perform, does not involve expensive equipment, and does not require significant technical expertise to obtain valid results, according to their report.

Incubation time is shorter than two other tests, allowing same-day results, and the costs are similar, the researchers reported. It is, however, subject to some false-positive and false-negative results, and the sensitivity for some drugs is above the minimum residue levels.

To further assess its potential as a replacement for the existing tests conducted in packing plants, parallel testing needs to be conducted on fresh tissues in a plant environment, the researchers concluded.

Faster Detection of Salmonella in Liquid Eggs Using IMS- ELISA

In the September 1995 issue of the same journal, Peter Holt and colleagues, of the Department of Agriculture's Southeast Poultry Research Laboratory in Athens, Ga., reported they have developed an assay that requires less time than conventional direct plating to detect Salmonella enteritidis in contaminated egg pools.

The immunomagnetic separation (IMS)-based assay used the Dynabeads Anti-Salmonella, a magnetic bead with mouse anti- Salmonella **antibodies** affixed to the surface, to bind the SE in the egg pools. The bound SE was concentrated by a magnet and was detected via an enzyme-linked immunosorbent assay (ELISA) (IMS-ELISA) employing a monoclonal anti-SE **flagella** proteins **antibody** . Following the ELISA, the beads were plated

onto differential media (IMS-direct), according to the report.

The IMS-ELISA provides an SE detection rate comparable to direct plating, but achieves the results 24 hours sooner, the researchers stated.

**Non-Antibiotic Culture Medium Developed For Bacillus cereus**

Researchers in Brazil have developed an alternative culture medium for isolation and quantification of Bacillus cereus in foods that is easier to make than the traditional Mossel medium and does not require the use of antibiotics.

Fernando Jose Meira de Vasconcellos and Leon Rabinovitch, Instituto Oswaldo Cruz, Rio de Janeiro, Brazil, reported in the March 1995 issue of the same journal that they designed the new formula to keep inhibition of B. cereus to a minimum while ensuring adequate suppression of contaminants without the use of antibiotics such as polymyxin B.

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PUBLISHER NAME: Food Chemical News, Inc.

EVENT NAMES: \*310 (Science & research)

GEOGRAPHIC NAMES: \*1USA (United States)

PRODUCT NAMES: \*0101100 (Food); 0110010 (Feed Grains)

INDUSTRY NAMES: BUSN (Any type of business); CHEM (Chemicals, Plastics and Rubber); FOOD (Food, Beverages and Nutrition)

NAICS CODES: 111 (Crop Production); 1111 (Oilseed and Grain Farming)

6/9/102 (Item 2 from file: 65)

DIALOG(R) File 65:Inside Conferences

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01397939 ~~INSIDE CONFERENCE ITEM ID: CN013869460~~

**Humoral immune response of chickens to Salmonella enteritidis (SE ) outer membrane protein (OMP) and flagellar antigens**

Baker, S. E.; Dunn, P.; Castro, A.; Maddox, C. W.

CONFERENCE: American Association of Veterinary Laboratory Diagnosticians- Annual meeting; 38th

ANNUAL MEETING- AMERICAN ASSOCIATION OF VETERINARY LABORATORY

DIAGNOSTICIANS, 1995; 38th P: 19

AAVLD, 1995

LANGUAGE: English DOCUMENT TYPE: Conference Abstracts and programme

CONFERENCE SPONSOR: American Association of Veterinary Laboratory Diagnosticians

CONFERENCE LOCATION: Sparks, NV

CONFERENCE DATE: Oct 1995 (19951) (19951)

BRITISH LIBRARY ITEM LOCATION: 1087.442000

DESCRIPTORS: veterinary laboratory diagnosticians; AAVLD

? t s6/3,kwic/65 69 70 71 72 80 85 100

>>>KWIC option is not available in file(s): 399

6/3,KWIC/65 (Item 1 from file: 349)

DIALOG(R) File 349:PCT FULLTEXT

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00413195

**RECOMBINANT SEF14 FIMBRIAL PROTEIN FROM SALMONELLA**

**PROTEINE FIMBRIEE SEF14 DE RECOMBINAISON, OBTENUE A PARTIR DE SALMONELLA**

Patent Applicant/Assignee:

REGENTS OF THE UNIVERSITY OF MINNESOTA,

RAJASHEKARA Gireesh,

NAGARAJA Kakambi V,

KAPUR Vivek,  
Inventor(s):  
RAJASHEKARA Gireesh,  
NAGARAJA Kakambi V,  
KAPUR Vivek,

Patent and Priority Information (Country, Number, Date):

Patent: WO 9803656 A1 19980129 ~~4~~  
Application: WO 97US12639 19970718 (PCT/WO US9712639)  
Priority Application: US 9622191 19960719

Designated States:

(Protection type is "patent" unless otherwise stated - for applications prior to 2004)

AL AM AT AU AZ BA BB BG BR BY CA CH CN CU CZ DE DE DK DK EE EE ES  
FI FI GB GE GH HU IL IS JP KE KG KP KR KZ LC LK LR LS LT LU LV MD MG MK  
MN MW MX NO NZ PL PT RO RU SD SE SG SI SK SK SL TJ TM TR TT UA UG US UZ  
VN YU ZW GH KE LS MW SD SZ UG ZW AM AZ BY KG KZ MD RU TJ TM AT BE CH DE  
DK ES FI FR GB GR IE IT LU MC NL PT SE BF BJ CF CG CI CM GA GN ML MR NE  
SN TD TG

Publication Language: English

Fulltext Word Count: 6323

Fulltext Availability:

Detailed Description

Detailed Description

... when

conventional bacterial cultures are used.

other diagnostic methods rely on the detection of serum **antibodies** specific to SE. Although several serological methods such as micro-agglutination, serum plate agglutination, latex...is a photograph showing a Western blot of the rSefl4 fragment probed with anti-Sefl4 **antibody** (lane 1) and anti-tag (T7) **antibody** (lane 2).

Figure 3 is a photograph showing results of a rSefl4-latex agglutination assay for SE infection in chickens exposed to *S. enteritidis* (A), *S. pullorum* (B), and serum-free antigen control (C).

Figure 4 is a photograph...

...of a

rSefl4-latex agglutination assay for SE infection in *S. pullorum* (C), *S. typhimurium* (D), *C. arizonae* (E), *E. coli*...

coli...

...Figure 5 is a graph showing the percentage of chickens testing positive for anti-SE **antibodies** during 4 weeks post-innoculation. The five bars at each week represent innoculation with 1...

...11 08 f10 10, and control (no cells).

Figure 6 is a graph showing the **antibody** titres of chicken sera samples testing positive for anti-SE

**antibodies** .

Figure 7 is a graph showing the **antibody** titres of chicken egg yolk samples testing positive for anti-SE **antibodies** .

Detailed Description of the invention

The present invention is directed to a method for diagnosing *Salmonella enteritidis* infection or evidence of infection in an animal, particularly poultry, using a recombinant truncated **fimbrial** antigen.

"Infection" means active colonization of the animal by SE organisms. "Evidence of infection" means...

...to alert against new infection or to trace the source of infection in a flock.

**Fimbrial** Proteins

**Fimbriae** are proteinaceous filamentous surface structures composed of protein subunits called fimbriae. These proteinaceous structures are...

...mucosal surfaces. They are present in most enteric bacteria capable of invading host cells.

*Salmonella enteritidis* has four distinct

**fimbriae** : Sef14, Sef17, Sef18 and Sef21 which are encoded by sefA, agfA, sefD and fimA genes, respectively. Sef14 is unique with only limited distribution in the genus. In contrast, all other **fimbrial** proteins are widely distributed in the genus. Thus, they have limited use as diagnostic reagents...

...a host using a plasmid or phage as a vector. Typically, the expression of Sef14 **fimbriae** by cultured *Salmonella enteritidis* is highly dependent on the growth medium composition (Thorns et al, International Journal of Food...

...it is useful in various immunological methods. For example, the inventive antigen is useful in **antibody** binding immunoassays such as assays to detect the presence of **antibodies** against SE in a sample. Suitable binding assays include ELISA, wherein the recombinant Sef14 antigen is bound to a surface and exposed to **antibodies** against SE.

To detect the presence of bound anti-SE **antibodies** , a marker such as an enzyme-linked secondary **antibody** is then added.

An agglutination assay using truncated Sef14 antigen-coated latex beads is preferred. In the agglutination reaction, antigen-coated latex beads form detectable clusters when exposed to **antibodies** against SE.

This preferred assay is described more fully in Example 4,

below.

Diacrnostic Assaya...

6/3,KWIC/69 (Item 5 from file: 349)  
DIALOG(R)File 349:PCT FULLTEXT  
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00277421 \*\*Image available\*\*

**METHODS AND COMPOSITIONS FOR DETECTION OF SALMONELLA**  
**PROCEDES ET COMPOSITIONS DE DETECTION DE LA SALMONELLE**

Patent Applicant/Assignee:

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Inventor(s):

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Patent and Priority Information (Country, Number, Date):

Patent: WO 9425597 A2 19941110  
Application: WO 94IB205 19940426 (PCT/WO IB9400205)  
Priority Application: US 9354452 19930426

Designated States:

(Protection type is "patent" unless otherwise stated - for applications  
prior to 2004)

AU BB BG BR BY CA CN CZ FI GE HU JP KG KP KR KZ LK LV MD MG MN MW NO NZ  
PL RO RU SD SI SK TJ TT UA UZ VN AT BE CH DE DK ES FR GB GR IE IT LU MC  
NL PT SE BF BJ CF CG CI CM GA GN ML MR NE SN TD TG

Publication Language: English

Fulltext Word Count: 28396

Fulltext Availability:

Detailed Description

Detailed Description

... blotting detection of Type I fimbrin protein conducted according to<sup>1</sup>  
Mfiller et al. using polyclonal **antisera** to native S.EF21 fimbriae were  
qualitatively compared to FimA production by S. enteritidis strain...

...whole cells was conducted by standard methods as described in Materials  
and Methods using polyclonal **antisera** to native SEF21 **fimbriae**. The  
results are presented as a percentage of the results obtained using cells  
of S...

...and subjected to Western blot analysis as described by Collinson et al.  
(8).

Anti-Agfa **immune** serum served as the primary **antibody**. Visualization  
of proteins that were immunologically cross-reactive with Agfa was  
accomplished by using goat, anti-rabbit, **immunoglobulin** G-alkaline  
phosphatase conjugates (Caltag Laboratories, ...L E 1 5

Subcloning and Sequencing of the fimA Gene

To isolate the S **enteritidis** fimA gene, a genomic DNA library was  
prepared in a BamI-R-digested, dephosphorylated cosmid...

6/3,KWIC/70 (Item 6 from file: 349)

DIALOG(R)File 349:PCT FULLTEXT  
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00245945

**METHOD OF TESTING FOR SALMONELLA**  
**METHODE POUR L'IDENTIFICATION DE SALMONELLES**

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WOODWARD Martin John,  
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Inventor(s):

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Patent and Priority Information (Country, Number, Date):

Patent: WO 9320231 A1 19931014

Application: WO 93GB647 19930329 (PCT/WO GB9300647)

Priority Application: GB 927069 19920331

Designated States:

(Protection type is "patent" unless otherwise stated - for applications  
prior to 2004)

AT AU BB BG BR CA CH CZ DE DK ES FI GB HU JP KP KR LK LU MG MN MW NL NO  
NZ PL PT RO RU SD SE SK UA US AT BE CH DE DK ES FR GB GR IE IT LU MC NL  
PT SE BF BJ CF CG CI CM GA GN ML MR NE SN TD TG

Publication Language: English

Fulltext Word Count: 8935

Fulltext Availability:

Detailed Description  
Claims

Detailed Description

... target sequence and affinity may be used  
for the determinative tests<sup>4</sup> Of particular use are **antibodies** raised  
to the SEFA antigen or an epitope of that, in so far as these...

...S.L.

ty2hi, thus providing a ready check as to identity of the organism.

These **antibodies** are subject of PCT/GB 91/01960 as described  
previously and hybridoma cells expressing one...

...OJQ, under

accession number 90101101 on 11th October 1990.

In all cases of use of **antibodies** as reagents in these tests it will  
be possible to enhance visualisation of the **antibody** -antigen binding  
phenomena by labelling them with coloured latex particles as is known  
in the...

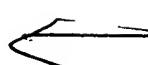
...and Michaelson (1984) Lab Management 22

27-40). Alternativley use may be made of secondary **antibodies** as is  
also known in the art whereby the secondary **antibody** is targeted at  
the **antibody** reagent and is labelled, eg. with gold, such that when  
excess unbound **antibody** is washed away, eg. so as to be removed from  
cells or **fimbria** in the sample, it is possible to observe the gold or  
other label clustered around the cells or **fimbria** thus indicating

**antibody** binding on these.

As further explained in PCT/GB 91/01690, it is found that factor in the in vitro production of SEFA epitopic sites on the *Salmonella fimbria* of the SEFA expressing strains. Peptone water and Enriched E broth (see Francis et al...

...agars. Suitable media may be selected for the ability to support SEFA expression by *S. enteritidis* as determined by antigen- **antibody** binding assay using one of the monoclonal **antibodies**, eg, that deposited as referred to above or other SEFA derived specific **antibodies**. The present invention further provides kits for performing the methods of this invention; kits for...

...SEFA expressing organisms or their SEFA associated components (ie, SEFA or an epitopic part thereof, **antibodies** to SEFA or epitopic parts thereof, polynucleotides encoding for SEFA or epitopic parts thereof) being...does not seem to adversely affect the test. 

Procedures for raising both polyclonal and monoclonal **antibodies** to salmonella surface antigens are well known. Thus, for example, *S.*

*enteritidis* may be grown...be observed by the presence of the bound label on the well, Other antibody/second **antibody** combinations will occur to the man skilled in the art (eg murine bovine or chicken **antibodies** /anti-murine anti-bovine or anti-chicken second **antibodies**), In a yet further way the **antibody** may be immobilised on a substrate and the immobilised **antibody** may then be exposed to a solution containing the antigen in the form of for example whole micro-organisms, the isolated *fimbriae* or the antigenic protein (SEFA), together with an agent capable of competing with the antigen for binding sites on the **antibody**. The quantity of the agent binding to the immobilised **antibody** may then be determined, eg: by use of known, labelling techniques. For example the competing agent may be a labelled anti-mouse IgG if the **antibody** is a mouse monoclonal, or may be labelled *fimbrial* antigen. The labels used in the above methods may be entirely conventional, and ways of labelling **antibodies** are well known.

The test kits may contain further reagents and other items for performance of the two or more determinations necessary (ie. the SEFA determination and the serotype *enteritidis* /dublin/typhi determination), For example as well the **antibodies** and the SEFA expression medium, visualising agents and standard result cards may be included. Depending upon the way in which the test is to be applied the **antibody** may be provided in the form of a solution, eg, for immunoagglutination or if the antigen is to be immobilised, or the **antibody** may be provided in the aforementioned immobilised form. The test kit may optionally also contain a further **antibodies** for further cross-checking salmonella serotype, instructions and appropriate vessels for ...as of serotype *S. typhi*, or as one of the SEFA expressing strains, comprise monoclonal **antibody** directed at SEFA, a polyclonal **antibody** directed-to *S. dublin flagella* p antigen but not

immunoreactive with **enteritidis** or typhi, a polyclonal **antibody** directed at G component of S. dublin and S. **enteritidis** **flagella** but not immunoreactive with S. typhi, reader cards and preferred growth medium optionally with any...

...test.

Coatline of latex: To prepare a batch of latex coated with any of the **antibodies**. Materials: Glycine buffered saline (GBS as above), Bovine serum albumen (fatty acids free) (Code A-6003, Sigma Chemicals), coloured latex (colour chosen to identify a particular **antibody** on its surface), 0.8microns, 10% suspension (Code K080, Estapor. Rhone-Poulenc), **antibody** containing fluid, Glass container of the suitable size - Pressmatic dispenser (Bibby) - Dropper bottles Labels - Rocking device  
Method: volumes of latex, **antibody** and GBS appropriate for that batch size are mixed in a glass container and incubated...

...old Balb/c mice.

Positive control SEFA, p protein (re dublin) or G component (re **enteritidis** and dublin) is/are preferably included in the kit or a sample of a salmonella...

...and S. typhi, In this protocol S. typhi does not react with any of the **antibodies**, although other protocols using positive identification will occur to those skilled in the art. The...

...control and reader cards are used to determine degree of response.

Note; other commercially available **antisera** are available which are  
4  
capable of differential binding with these three significant SEFA expressing...

#### Claim

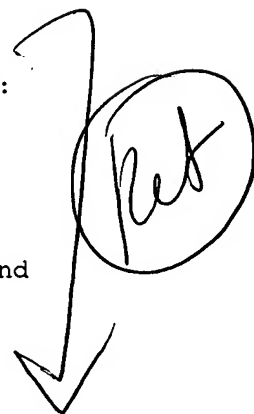
... A test kit as claimed in claim 17 further comprising one or more of:  
(i) **antibodies** to SEFA or an epitopic part thereof or cells capable of producing those **antibodies** ;  
(ii) SEFA or an epitopic part thereof in the form of cells, **fimbria** isolated SEFA or said part or any of these immobilised onto a surface;  
(iii) secondary **antibodies** capable of specific binding to the **antibodies** to SEFA or to **antibodies** to the epitopic part thereof and  
(vi) medium or media capable of supporting or switching off expression of SEFA by S. **enteritidis** and/or S. dublin or essential components ...such medium or media.

19 A test kit as claimed in claim 18 wherein the **antibodies** are immobilised on a solid carrier.

20 A test kit as claimed in claim 18 or 19 further comprising an **antibody** labelling agent,

21 A test kit as claimed in Claim 20 wherein the labelling agent...

...A test kit as claimed in any one of Claims 18 to 21 wherein the **antibodies** are in labelled form.



23 A test kit as claimed in Claim 22 wherein the...

6/3,KWIC/71 (Item 7 from file: 349)  
DIALOG(R)File 349:PCT FULLTEXT  
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00208995

**SALMONELLA POLYNUCLEOTIDE SEQUENCE**

**SEQUENCE DE POLYNUCLEOTIDES DE LA SALMONELLE**

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Inventor(s):

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Patent and Priority Information (Country, Number, Date):

Patent: WO 9206198 A1 19920416

Application: WO 91GB1691 19911001 (PCT/WO GB9101691)

Priority Application: GB 9021338 19901001; GB 9022570 19901017

Designated States:

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prior to 2004)

AT AU BE BG BR CA CH DE DK ES FI FR GB GR HU IT JP KR LU NL NO PL RO SE  
SU US

Publication Language: English

Fulltext Word Count: 8541

Fulltext Availability:

Detailed Description

Detailed Description

... and transformed

cells containing said polynucleotide sequences,  
Organisms of the genus Salmonella, in particular S, **enteritidis** , S.

dublin and S. typh: ,murium are responsible for infective food  
poisoning caused by their...

...monoclonal antibodies ("MABs"), to specific antigens are  
raised and which by exploitation of the antigen - **antibody** specific  
binding reaction the presence of the antigen can be detected. Such  
tests are fast and very specific.

It is known that Salmonella organisms have **fimbria** like structures on  
their surface (Duguid; J. P and R. R. Gillies (1958) J. Pathol...

...Gerlach (1987) J. Bacterial. !EQ.:9 Qq ) suggests that there are  
antigenically distinct types of **fimbriae** , ie. possessing specific  
epitopes on the **fimbrial** antigens. The possibility of immunogenic  
tests for Salmonella, at least S. **enteritidis** , based upon these  
**fimbrial** antigens has been suggested (MAFF, Central Veterinary  
Laboratory "Animal Health" (1989):33). Methods of raising...

...surface of micro-organisms such as Salmonella are  
generally known.

Unfortunately known methods for raising **antibodies** to Salmonella  
surface antigens only go part way toward providing an immunological

test for Salmonella...

...then applying the test.

A problem occurs in that although Salmonella micro-organisms produce their **fimbrial** antigen when they grow in vivo, eg. in the gut, in animal tissues or fluids, in food products and in some natural environments, many of the **fimbrial** antigens are not produced when they are grown in vitro,

The present inventors have determined the polynucleotide sequence responsible for producing a characteristic **fimbrial** antigen, Salmonella **enteritidis** **fimbrial** antigen (SEFA). SEFA has an amino acid sequence forming an epitope on the **fimbria** 'in vivo' which is specifically found encoded by the DNA of the species S. **enteritidis** and some strains of the species S. dublin and S. Moscow but which is apparently...

...be expected that allelic variation will occur in some organisms.

AMINO ACID SEQUENCE OF SALMONELLA **ENTERITIDIS** **FIMBRIAL** ANTIGEN  
M L I V D F W R F C N M R K...VIII or IX

have been inserted as these will be readily provided from cultured S.

**enteritidis** or S. dublin by use of restriction endonucleases and encode for the entire SEFA amino acid sequence. In this respect use of **antibodies** targeted for SEFA allows facile recognition of transformed organisms which is particularly useful for selecting expressing organisms from a background population. Such **antibodies** are the subject of copending MAFF patent application (PCT GB 91 ----our reference P0958) of...

...ligated into a plasmid such as

PUC18. Alternatively total genomic DNA is extracted from S.

**enteritidis** or a strain of S. dublin possessing said **fimbrial** antigen, as determined using the monoclonal **antibodies** and techniques disclosed in the applicants copending application referred to above, and then partially digested...be made from the small quantities which may be available by isolation from the S, **enteritidis** or S, dublin thus increasing the amount of sequence available to be detected. The mere...

...of the invention for confirming presence of transformants.

Example A. Preparation and cloning of S. **enteritidis** **fimbrial** antigen genes,

Step A1. Total genomic DNA was extracted from S. **enteritidis** using the method described in J B Goldberg & D E Ohman, (1984) J Bact 15...

...compatible cohesive ends with SauIIIA, and was dephosphorylated with calf intestinal phosphatase.

Step A2 S. **enteritidis** DNA was ligated with vector PUC18 using T4 DNA ligase supplied by Bethesda Research Laboratories...

...by replica plating for Western Blotting. Standard Western Blotting procedures using the S. enteritidis **fimbrial** antigen

specific monoclonal **antibody** MAB 69/25, derived by standard techniques from hybridoma cells deposited under Accession No...thus containing the aforementioned sequences (VI), (VII) and (IX).

Step A7. The recombinant plasmids from **fimbrial** antigen positive transformants were extracted and used in confirmatory tests to prove the insert encoded...

6/3,KWIC/72 (Item 8 from file: 349)  
DIALOG(R)File 349:PCT FULLTEXT  
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00208994

**METHOD OF TESTING FOR SALMONELLA**  
**PROCEDE DE DEPISTAGE DE LA SALMONELLE**

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THORNS Christopher John,

Inventor(s):

THORNS Christopher John,

Patent and Priority Information (Country, Number, Date):

Patent: WO 9206197 A1 19920416

Application: WO 91GB1690 19911001 (PCT/WO 9101690)

Priority Application: GB 9021290 19901001; GB 9022570 19901017; GB 916546  
19910327

Designated States:

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AT AU BE BG BR CA CH DE DK ES FI FR GB GR HU IT JP KR LU NL NO PL RO SE  
SU US

Publication Language: English

Fulltext Word Count: 12645

Fulltext Availability:

Detailed Description

Claims

English Abstract

A method of testing for the presence of Salmonella serotypes S.  
**enteritidis** and S. dublin is provided. Novel monoclonal **antibodies** are used to detect the presence of an epitope specific for these serotypes in cultures which have been grown on selected media which enhance the expression of said epitope in **fimbrial** sites. Test kits utilising the antigen or its epitopic parts, **antibodies** and/or the media are further provided.

Detailed Description

... to antigens containing  
antigenic amino acid sequences expressed specifically by these serotypes,  
to specific monoclonal **antibodies** for use in said method and to kits  
for  
performing tests according to said method...certain media  
to enable or cause Salmonella to produce this specific fimbrial antigen  
(Salmonella enteritidis **fimbrial** antigen-SEFA) during in vitro culture,  
whereby prior to the step of exposure to the...

...E-own in vitro in or on such a medium such that they produce antigenic **fimbriae** having epitopic sites thereupon, allows reliable immuno-testing.

The influence of the medium appears to be particularly pronounced in the case of the said important Salmonella micro-organisms **S. enteritidis** and **S. dublin**. The method of the invention is therefore particularly suitable for the specific testing for the presence of **S. enteritidis** and

**S. dublin** by the use of antibody - antigen binding, as these two Salmonella strains produce strongly antigenic **fimbriae** under the conditions of this invention, particularly of the preferred embodiment.

The method appears to...

...culture medium is a crucial factor in the production of epitopic sites on the Salmonella **fimbria**. Media which are "defined" or at least "semi-defined" as understood in the art are...invention provides a method of testing for the presence of microorganisms of Salmonella serotypes **S. enteritidis** or **S. dublin** comprising exposing an analyte suspected of containing them or their **fimbrial** antigen (SEFA as described herein) to an antibody raised to said **15 fimbrial** antigen or to an epitopic part thereof, and then relating the occurrence of antibody-antigen...

...provides a method of determining the identity of a Salmonella serotype as being either **S. enteritidis** or **S.**

**dublin** comprising (a) exposing an analyte suspected of comprising at least one of said serotypes or their **fimbrial** antigen (SEFA as described herein) to an antibody raised to said **fimbrial** antigen, or a part thereof, and 30 then relating the occurrence of antibody-antigen specific...

...further provides a method of testing for the presence of organisms of Salmonella serotypes **S. enteritidis** or **S. dublin** comprising (a) seeding a sample of an analyte suspected of containing them into/onto a culture medium selected for its ability to support expression of Salmonella **enteritidis fimbrial** antigen (SEFA); (b) culturing said seeded culture medium and; (c) exposing a sample derived from...part of SEFA. Particularly conveniently the expressed SEFA is identified using one of the monoclonal **antibodies** MAB 69/25 or MAB 71/3, from cells deposited as detailed above.

Particular SEFA...37'C until a sufficient number of the micro-organisms having epitopic sites on their **fimbriae** have grown, for example typically by overnight incubation. An incubation temperature of above 22'C...

...in the identification of the serotype of pure cultures of Salmonella organisms; ie: as **S. enteritidis**, **S. dublin** or other, further antibodies being usable to distinguish them further.

Procedures for raising...

...polyclonal and monoclonal antibodies to  
Salmonella surface antigens are well known. Thus, for example, S.

**enteritidis** may be grown on a medium as described above so that antigenic **fimbriae** are produced, these then may be used to immunise mice from which spleen cells are...producing hybridomas may then be cloned to produce a mouse monoclonal antibody to the Salmonella **fimbrial** antigen. MABs may be produced by the known method of intraperitoneally injecting hybridoma cells (eg...

...particularly preferred monoclonal antibody is one having a specific immuno-affinity for the specific S. **enteritidis fimbrial** antigen (SEFA)  
produced by growth on one of the aforementioned media, ie, an antigenic protein fraction having a molecular weight of around 14,300 identified in the **fimbrial** structure after such growth conditions and having a major antigenic activity, or for immunoreactive (eg...

...extends to (i) the determination of media suitable for growing salmonella possessing the required antigenic **fimbriae** and (ii) for identification of said antigenic **fimbriae** and antigens comprising the SEFA epitope itself. Thus further specific media suitable for the performance...

...the whole Salmonella micro-organisms (live or dead) or a part thereof which includes the **fimbrial** antigen with the SEFA epitopic site may be detected by the antibody. In the latter...

...known, eg mild heat shock treatment at 60°C for 30 minutes, for detaching **fimbriae** from Salmonella micro-organisms; and isolation of the **fimbrial** antigen in this way should lead to a more specific test result. The epitopic sites...

...testing method of the preferred embodiment of the invention appear to be present on a **fimbrial** structure produced on the surface of S. **enteritidis** and S. dublin grown on media of the present invention and in vivo, which is...

...of identical repeating subunits each of molecular weight between 14,000 and 15,000. These **fimbriae** have a 'kinked' conformation such that they entangle and extend in a matted form to...art.

In another way immunoagglutination may be observed by simply adding a solution of the **antibody** to a solution or suspension of the micro-organisms or to a culture thereof or...5% NM chloronaphthol and 0.015% (w/v) hydrogen peroxide as substrate.

5. Conventional and **immune** elcct copy. This was undertaken to locate the antigen recognised by MAB 69/25. Salmonella...to 0.1micrometres from the cell surface, and was also found in detached amorphous clumps.

**Flagellae** and type 1 **fimbriae** were unlabelled. Two further S, **enteritidis**

strains and three S. dublin strains that reacted in the direct binding ELISA, also expressed this **fimbrial** material which was specifically labelled with the MAB, although many S. dublin organisms appeared within a population not to express this structure or epitope. **Fimbrial** antigen 5 was not detected or labelled when the same strains of S. **enteritidis** and S. dublin were grown at 22'C. Strains of S. zallinarum, S. pullorum and...

...6. Conclusion.. The above experiments illustrate the identification of a specific antigen located on the **fimbriae** of strains of S. **enteritidis** grown on Slanetz broth, a semi-defined medium, at 37'C, and the raising of...

...a further 264 Salmonella strains from 63 serotypes were examined. All the strains of S.

**enteritidis** tested, regardless of phage type, reacted with this MAB. S. dublin (12/36 strains) and...

...Electron microscope studies confirmed that MAB 69/25 is directed against an epitope on a **fimbrial** structure expressed on the bacterial surface that is morphologically distinct from **flagellae** and the larger type 1 **fimbriae**. This structure was observed only on Salmonella strains that reacted in direct binding ELISAs and these strains were labelled when examined by immune EM.

This **fimbrial** structure is much smaller than the type 1 **fimbriae** commonly found on Salmonella strains (Clegg et al above), and unlike type 3 **fimbriae** carried by Salmonellae, it lacks any haemagglutinating activity (Clegg et al above; Abegbola, R. A...

...agglutination with the provided 10 antibodies MAB 69/25 or MAB 71/3 or other **antibodies** raised against SEFA.

Such determination would involve no undue experimentation or inventive input. Thus the...Choose the batch size (volume) of latex to be prepared (ii)

Mix volumes of latex, **antibody** and GBS appropriate for that batch size in a glass container and incubate for 2...

...against S. dublin), To prepare a batch of latex coated with rabbit polyclonal serum against **flagella** of S. dublin.

Materials: The polyclonal serum is prior absorbed with S. **enteritidis** to remove all **antibody** crossreacting with it. Glycine buffered saline (GBS); Bovine serum albumin (fatty acids free) Code A...container; Pressmatic dispenser (Bibby); Dropper bottles; Labels; Rocking device.

Preparation Volumes, every new batch of **antibody** has to be titrated to determine optimal volumes for coating.

Red latex **Antibody** GBS Batch size Bottle No.

ml ml ml ml  
1.5 0,5 6.0...

...Choose the batch size (volume) of latex to be prepared (ii)  
Mix volumes of latex, **antibody** and GBS in a glass container and incubate for 2 hours at 37'C with...of SEFA bearing materials (eg; whole organisms). Test latex 2 is used to differentiate S. **enteritidis** and S. dublin, the latter only binding to it. The control latex aids determination of...

...Dorset egg slopes and grown in peptone water for 18hours at 37°C.

Purification of SEFA: **Fimbrial** antigens were prepared from S.

**enteritidis** 468/86 which has been identified as expressing large quantities of the **fimbriae**. The organisms were grown on Sensitest agar (Oxoid, Basingstoke, United Kingdom) overnight at 37'C. Bacteria were sedimented and suspended in phosphate buffered saline (PBS) pH 6 The **fimbriae** were then removed from the surface of the bacteria by heating the suspension at 60...

...determined by sodium dodecyl-sulphate-polyacrylamide gel-electrophoresis (SDS-PAGE) using 12.5% gels.

Rabbit **antisera**. New Zealand White rabbits were injected subcutaneously into two separate sites with 50micrograms of purified...

...later and blood was collected 10 days after the final inoculation. The specificity of the **antisera** was checked by enzyme-linked immunosorbent assay (ELISA) and **immune** electron microscopy (IEM).

Production of MABs. Female BALB/c mice were injected intraperitoneally with 50micrograms...distributed evenly throughout SEFA in all cases and was similar to the labelling of the **fimbrial** antigen with RaSEFA.

Individual MABs and RaSEFA reacted identically suggesting ...SEFA is expressed by only a few Salmonella serotypes all within serogroup D. All S. **enteritidis** strains grown in peptone water express large quantities of SEFA. However, under the same growth...

...similar numbers of gold particles associated with SEFA suggesting that the size of the rabbit **antibodies** and gold particles inhibits the binding to closely oriented epitopes. The fact that the majority...

...b Epitope

Antigens 14300 molecular Affinity Cluster wt. SEFA

Whole S. SEFA-1 IgG, + + ++ 1

**enteritidis** SEFA-2 IgG, + + ++ 1

strain SEFA-3 IgG, + + ++ 1

1246/89 cells  
Crude and sEFA...

...MAB 69/25

SEFA-9 is MAB 71/3

#### ELECTRON MICROSCOPY FIGURES

FIG. 1. *S. enteritidis* negatively stained with PTA showing three distinct surface organelles. A; fine **fimbrial** material radiating from cell surface and a detached **flagellum** (arrow). Bar, 200nm. B; **fimbrial** material (fa) forming matted appearance, and type 1 **fimbriae** (arrows).

Bar 200nm.

FIG. 2. *S. enteritidis* organisms probed with Mab 69/25 and labelled with immunogold. A; specific labelling of matted **fimbrial** antigen (fa) uniformly covering the cell surface. Bar, 600 nm. B; gold particles attached to matted **fimbrial** antigen (fa), but **flagella** and type 1 **fimbriae** (arrows) are unlabelled. Bar, 400nm.

FIG. 3. Two *S. dublin* organisms from culture probed with...immunogold. Cell 'a' is heavily labelled with gold particles, Cell 'b' does not exhibit surface **fimbrial** material and is unlabelled. Flagella fragments are unlabelled. Bar, 600nm.

#### Claim

1 A method of testing for the presence of microorganisms of *Salmonella* serotypes *S. enteritidis* or *S. dublin* comprising exposing an analyte suspected of containing them or their **fimbrial** antigen (SEFA as described herein) to an antibody raised to said **fimbrial** antigen or an epitopic part thereof, and then relating the occurrence of antibody-antigen specific...

...method of testing for the presence of antibodies to SEFA (as described herein) comprising exposing **fimbrial** antigen (SEFA as described herein) or an epitopic part thereof to an analyte suspected of ...

...antibodies.

3 A method for the detection of infection by microorganisms of the serotypes *S. enteritidis* or *S. dublin* comprising use of a method as claimed in claim 2 to test...

...4 A method of determining the identity of a *Salmonella* serotype as being either *S. enteritidis* or *S. dublin* comprising:  
(a) exposing an analyte suspected of comprising at least one of said serotypes or their **fimbrial** antigen (SEFA as described herein) to an antibody raised to said **fimbrial** antigen, or an epitopic part thereof, and then relating the occurrence of antibody-antigen specific...

...serotype.

6 A method of testing for the presence of organisms of *Salmonella* serotypes *S. enteritidis* or *S. dublin* comprising:  
(a) seeding a sample of an analyte suspected of containing them into/onto a culture medium selected for its ability to support expression of

Salmonella **enteritidis** **fimbrial** antigen (SEFA);  
(b) culturing said seeded material on said culture medium and;  
(c) exposing a sample derived from the culture derived from step (b) to an antibody raised to said **fimbrial** antigen, or a part thereof, and then relating the occurrence of antibody-antigen specific binding...

...screening candidate culture media for the ability to support the expression of SEFA by S. **enteritidis** or a SEFA producing strain of -5, dublin, wherein the screening comprises identifying antibody-antigen...

...an antibody raised to SEFA or an epitopic part thereof and the salmonella cells or **fimbriae** cultured on said media,  
8 A method as claimed in Claim 7 wherein the **antibody** is one of the monoclonal **antibodies** MAB 69/25 or MAB 71/3, (deposited as detailed herein).

9 A method as claimed in Claim 7 wherein the **antibody** is one that has been raised to an antigen which comprises an epitopic part of...

...any one of Claims 3 to 12 comprising:  
(a) cells which are capable of producing **antibodies** which are capable of specifically binding to SEFA or an epitopic part thereof, and/or (b) said **antibodies** themselves.

16 A test kit as claimed in Claim 15 comprising  
(a) hybridoma cells which are capable of producing monoclonal **antibodies** which are capable of specifically binding to SEFA or an epitopic part thereof, and/or (b) said monoclonal **antibodies** themselves.

17 A test kit as claimed in Claim 16 wherein the hybridoma cells and/or **antibodies** are those as claimed in Claim 13 or 14 respectively.

18 A test kit as claimed in Claim 15 or 16 wherein the **antibodies** are immobilised on a solid carrier.

19 A test kit as claimed in any one of Claims 15 to 18 further comprising an **antibody** labelling agent.

21 A test kit as claimed in Claim 19 wherein the labelling agent...

...A test kit as claimed in any one of Claims 15 to 18 wherein the **antibodies** are in labelled form.

21 A test kit as claimed in any one of Claims...

...for preparation of a medium capable of causing or supporting expression of SEFA by S, **enteritidis** or S, dublin.

22 A test kit as claimed in Claim 21 wherein the components...test kit for use in a method as claimed in Claim 2 comprising Salmonella enteritidis **fimbrial** antigen (SEFA) or an epitopic part thereof.

25 A test kit as claimed in Claim 24 wherein the SEFA or epitopic part thereof is derived from S. **enteritidis** or S. dublin microorganisms.

26 A test kit as claimed in Claim 24 where in the SEFA is in the form of detached **fimbriae** .

27 A test kit as claimed in any one of Claims 24 to 26 wherein...

...Claim 27 wherein the substrate is a microtitre plate.

29 An isolated polypeptide comprising Salmonella **enteritidis** **fimbrial** antigen (SEFA as defined herein) or an epitopic part thereof,

30 An isolated polypeptide as claimed in Claim 26 comprising Salmonella **eneteritidis** **fimbrial** antigen (as defined herein).

6/3,KWIC/80 (Item 1 from file: 399)

DIALOG(R) File 399:CA SEARCH(R)

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129314717 CA: 129(24)314717p JOURNAL

Synthesis of flagellin fragments and studies of their interactions with antibodies. Part I

AUTHOR(S): Klugmann, K.; Kunikowska, D.; Glosnicka, R.; Mackiewicz, Z.

LOCATION: Faculty Chemistry, Univ. Gdansk, 80-952, Gdansk, Pol.

JOURNAL: Pol. J. Chem. DATE: 1998 VOLUME: 72 NUMBER: 9 PAGES:

2093-2097 CODEN: PJCHDQ ISSN: 0137-5083 LANGUAGE: English PUBLISHER: Polish Chemical Society

6/3,KWIC/85 (Item 4 from file: 654)

DIALOG(R) File 654:US Pat.Full.

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3715594

Derwent Accession: 1992-150883

Utility

EXPIRED

C/ Method of testing for the presence of Salmonella serotypes expressing Salmonella enteritidis fimbrial antigen (SEFA) and reagents therefore ; USING MONOC LONAL AN TIBODIES

Inventor: Thorns, Christopher J., Woking, GB England

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(Code: 19430)

Examiner: Scheiner, Toni R. (Art Unit: 182)

Assistant Examiner: Duffy, Patricia A.

Law Firm: Nixon & Vanderhye

	Publication Number	Kind	Date	Application Number	Filing Date
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Main Patent	US 5510241	A	19960423	US 95449922	19950525
Continuation	Abandoned			US 9330208	19930326
Priority				GB 9021290	19901001
				GB 9022570	19901017
				GB 916546	19910327

Abstract:

A method of testing for the presence of Salmonella serotypes S. **enteritidis** and S. dublin is provided. Novel monoclonal **antibodies** are used to detect the presence of an epitope specific for these serotypes in cultures which have been grown on selected media which enhance the expression of said epitope in **fimbrial** sites. Test kits utilizing the antigen or its epitopic parts, **antibodies** and/or the media are further provided.

Summary of the Invention:

- ...organisms may be detected. In recent years immunological tests have been devised in which specific **antibodies**, particularly monoclonal **antibodies** ("MABs"), to specific antigens are raised and which, by exploiting the antigen-**antibody** specific binding reaction, the presence of the antigen can be detected. Such tests are fast. It is known that Salmonella organisms have **fimbria**-like structures on their surface (Duguid; J. P.; and R. R. Gillies. (1958) J. Pathol...
- ...1987) J. Bacteriol. 169:934-938), suggests that there are antigenically distinct types of such **fimbriae**, ie possessing specific epitopes on the **fimbrial** antigens. The possibility of immunogenic tests for Salmonella, at least S. **enteritidis**, based upon these **fimbrial** antigens has been suggested (MAFF, Central veterinary Laboratory "Animal Health" (1989):33). Methods of raising...
- ...Unfortunately known methods of raising **antibodies** to Salmonella surface antigens only go part way toward providing an immunological test for Salmonella...
- ...A problem occurs in that it is found that although Salmonella micro-organisms produce their **fimbrial** antigen when they grow in vivo, e.g. ...animal tissues or fluids, in food products and in some natural environments, many of the **fimbrial** antigens are not produced when they are grown in vitro on most culture media...
- ...with the object of identifying the conditions necessary to induce the Salmonella micro-organisms S. **enteritidis** and S. dublin to produce a specific **fimbrial** antigen during in vitro culture so that immunological tests may be applied. This has provided...
- ...method for testing for the presence of micro-organisms of the species Salmonella, serotypes S. **enteritidis** and S. dublin, using the specific **fimbrial** antigen or an epitopic part thereof to bind them. Thus suspect biological fluids may be tested for such **antibodies** with the aim of identifying cases of S. **enteritidis** or S. dublin infection. The particular specific antigen identified by the present inventors has been ...
- ...of the ability of certain media to enable or cause Salmonella to produce this specific **fimbrial** antigen (Salmonella enteritidis **fimbrial** antigen-SEFA) during in vitro culture, whereby prior to the step of exposure to the **antibody** the micro-organisms are grown in vitro in or on such a medium such that they produce antigenic **fimbriae** having epitopic sites thereupon, allows reliable immuno-testing...to be

particularly pronounced in the case of the said important Salmonella micro-organisms S. **enteritidis** and S. dublin. The method of the invention is therefore particularly suitable for the specific testing for the presence of S. **enteritidis** and S. dublin by the use of **antibody**-antigen binding, as these two Salmonella strains produce strongly antigenic **fimbriae** under the conditions of this invention, particularly of the preferred embodiment. The method appears to...

...culture medium is a crucial factor in the production of epitopic sites on the Salmonella **fimbria**. Media which are "defined" or at least "semi-defined" as understood in the art are...invention provides a method of testing for the presence of microorganisms of Salmonella serotypes S. **enteritidis** or S. dublin comprising exposing an analyte suspected of containing them or their **fimbrial** antigen (SEFA as described herein) to an antibody raised to said **fimbrial** antigen or to an epitopic part thereof, and then relating the occurrence of antibody-antigen...provides a method of determining the identity of a Salmonella serotype as being either S. **enteritidis** or S. dublin comprising (a) exposing an analyte suspected of comprising at least one of said serotypes or their **fimbrial** antigen (SEFA as described herein) to an antibody raised to said **fimbrial** antigen, or a part thereof, and then relating the occurrence of antibody-antigen specific binding...

...sample of said analyte suspected of comprising at least one of said serotypes to an **antibody** raised to specifically bind to the second one of said serotypes but not to the first and relating the occurrence of **antibody**-antigen specific binding to the presence of said second serotype...

...further provides a method of testing for the presence of organisms of Salmonella serotypes S. **enteritidis** or S. dublin comprising (a) seeding a sample ...them into/onto a culture medium selected for its ability to support expression of Salmonella **enteritidis** **fimbrial** antigen (SEFA); (b) culturing said seeded culture medium and; (c) exposing a sample derived from the culture derived from step (b) to an **antibody** raised to said **fimbrial** antigen, or an epitopic part thereof, and then relating the occurrence of **antibody**-antigen specific binding to the presence of said serotypes...

...may be identified by comparison with previously isolated SEFA or by its ability to produce **antibody**-antigen specific binding with **antibodies** raised to SEFA or an epitopic part of SEFA. Particularly conveniently the expressed SEFA is identified using one of the monoclonal **antibodies** MAB 69/25 or MAB 71/3, from cells deposited as detailed above...s)] C. until a sufficient number of the micro-organisms having epitopic sites on their **fimbriae** have grown, for example typically by overnight incubation. An incubation temperature of above 22[degree...

...in the identification of the serotype of pure cultures of Salmonella organisms; ie: as S. **enteritidis**, S. dublin or other, further antibodies being usable to distinguish them further...polyclonal and monoclonal antibodies to Salmonella surface antigens are well known. Thus, for example, S. **enteritidis** may be grown on a medium as described above so that antigenic **fimbriae** are produced, these then may be used to immunise mice from which spleen cells are...

...producing hybridomas may then be cloned to produce a mouse monoclonal antibody to the Salmonella **fimbrial** antigen. MABs may be produced by

the known method of intraperitoneally injecting hybridoma cells (e...

- ...particularly preferred monoclonal antibody is one having a specific immuno-affinity for the specific *S. enteritidis* **fimbrial** antigen (SEFA) produced by growth on one of the aforementioned media, ie. an antigenic protein fraction having a molecular weight of around 14,300 identified in the **fimbrial** structure after such growth conditions and having a major antigenic activity, or for immunoreactive (e...extends to (i) the determination of media suitable for growing salmonella possessing the required antigenic **fimbriae** and (ii) for identification of said antigenic **fimbriae** and antigens comprising the SEFA epitope itself. Thus further specific media suitable for the performance...
- ...the whole Salmonella micro-organisms (live or dead) or a part thereof which includes the **fimbrial** antigen with the SEFA epitopic site may be detected by the antibody. In the latter...
- ...g. mild heat shock treatment at 60[degree(s)] C. for 30 minutes, for detaching **fimbriae** from Salmonella micro-organisms, and isolation of the **fimbrial** antigen in this way should lead to a more specific test result. The epitopic sites...
- ...testing method of the preferred embodiment of the invention appear to be present on a **fimbrial** structure produced on the surface of *S. enteritidis* and *S. dublin* grown on media of the present ...of identical repeating subunits each of molecular weight between 14,000 and 15,000. These **fimbriae** have a 'kinked' conformation such that they entangle and extend in a matted form to...
- ...second antibody may, for example, be an anti-mouse Ig G. The binding of the **antibody** to the **fimbriae** may then be detected using microscopy to observe the clustering of gold...

#### Description of the Invention:

- ...For **immune** electron microscopy antigen coated grids were floated on 1 drop of an optimum dilution of flagellae and type 1 **fimbriae** were unlabelled. Two further *S. enteritidis* strains and three *S. dublin* strains that reacted in the direct binding ELISA, also expressed this **fimbrial** material which was specifically labelled with the MAB, although many *S. dublin* organisms appeared within a population not to express this structure or epitope. **Fimbrial** antigen was not detected or labelled when the same strains of *S. enteritidis* and *S. dublin* were grown at 22[degree(s)] C. Strains of *S. gallinarum*, S...
- ...The above experiments illustrate the identification of a specific antigen located on the **fimbriae** of strains of *S. enteritidis* grown on Slanetz broth, a semi-defined medium, at 37[degree(s)] C., and the...
- ...a further 264 Salmonella strains from 63 serotypes were examined. All the strains of *S. enteritidis* tested, regardless of phage type, reacted with this MAB. *S. dublin* (12/36 strains) and...
- ...Electron microscope studies confirmed that MAB 69/25 is directed against an epitope on a **fimbrial** structure expressed on the bacterial surface that is morphologically distinct from **flagellae** and the larger type 1 **fimbriae**. This structure was observed only on Salmonella strains that reacted in direct binding ELISAs and...

...This **fimbrial** structure is much smaller than the type 1 **fimbriae** commonly found on Salmonella strains (Clegg et al above), and unlike type 3 **fimbriae** carried by Salmonellae, it lacks any haemagglutinating activity (Clegg et al above; Abegbola, R. A...

...Old. D. C., and R. A. Adegbola, 1985. J. Med. Microbiol. 20: 113-121). This **fimbrial** structure, which carries an epitope restricted to all strains of S. enteritidis and certain strains...for agglutination with the provided antibodies MAB 69/25 or MAB 71/3 or other **antibodies** raised against SEFA. Such determination would involve no undue experimentation or inventive input. Thus the...To prepare a batch of latex coated with rabbit polyclonal serum against **flagella** of S. dublin The polyclonal serum is prior absorbed with S. **enteritidis** to remove all **antibody** crossreacting with it. Glycine buffered saline (GBS); Bovine serum albumin (fatty acids free) Code A... **Fimbrial** antigens were prepared from S. **enteritidis** 468/86 which has been identified as expressing large quantities of the **fimbriae** .

...C. Bacteria were sedimented and suspended in phosphate buffered saline (PBS) pH 6.8. The **fimbriae** were then removed from the surface of the bacteria by heating the suspension at 60...

...Rabbit **antisera**

Exemplary or Independent Claim(s):

- ...method of testing a sample for the presence of microorganisms for Salmonella serotypes expressing Salmonella **enteritidis** **fimbrial** antigen (SEFA) comprising the steps of...
- ...a) exposing a sample suspected of containing the microorganisms, or SEFA to an **antibody** which specifically binds to the antigen specifically bound by the monoclonal **antibody** secreted by ECACC 90101101 or ECACC 90121902 or an **antibody** which specifically binds the epitope bound by the monoclonal **antibody** secreted by ECACC 90101101 or ECACC 90121902...
- ...b) detecting **antibody** -antigen specific binding, wherein antigen-**antibody** specific binding is indicative of the presence of microorganisms selected from the group consisting of S. **enteritidis** , S. dublin, S. moscow and S. blegdam, and the absence of **antibody** -antigen specific binding is indicative of the absence of S. enteritidis.

Non-exemplary or Dependent Claim(s):

- ...of said sample suspected of containing at least one of said Salmonella serotypes to an **antibody** which specifically binds S. enteritidis but not S. dublin and detecting **antibody** -antigen specific binding wherein **antibody** antigen specific binding indicates the presence of S. enteritidis, S. moscow or S. blegdam...of said sample suspected of containing at least one of said Salmonella serotypes to an **antibody** which specifically binds S. dublin but not S. **enteritidis** and detecting **antibody** -antigen specific binding wherein **antibody** antigen specific binding indicates the presence of S. dublin, S. moscow or S. blegdam...
- ...of containing the organisms into or onto a culture medium supporting the expression of Salmonella **enteritidis** **fimbrial** antigen...c)

exposing a second sample obtained from the culturing step (b) to an **antibody** which specifically binds to the antigen specifically bound by the monoclonal **antibody** secreted by ECACC 90101101 or ECACC 90121902 or an **antibody** which specifically binds the epitope bound by the monoclonal **antibody** secreted by ECACC 90101101 or ECACC 90121902 and then detecting **antibody** -antigen specific binding wherein **antibody** -antigen specific binding is indicative of the presence of organisms of the group of Salmonella...Salmonella serotypes expressing SEFA, said test kit comprising SEFA, wherein the SEFA specifically binds an **antibody** which specifically binds to the antigen specifically bound by the monoclonal **antibody** secreted by ECACC 90101101 or ECACC 90121902 or an **antibody** which specifically binds the epitope bound by the monoclonal **antibody** secreted by ECACC 90101101 or ECACC 90121902...A test kit as claimed in claim 25 wherein the SEFA is obtained from S. **enteritidis** or S. dublin microorganisms...

...in claim 25 or claim 26 wherein the SEFA is in the form of detached **fimbriae** .

6/3,KWIC/100 (Item 1 from file: 340)  
 DIALOG(R) File 340:CLAIMS(R)/US Patent  
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2711032 9609475

C/METHOD OF TESTING FOR THE PRESENCE OF SALMONELLA SEROTYPES EXPRESSING  
**SALMONELLA ENTERITIDIS FIMBRIAL ANTIGEN (SEFA) AND REAGENTS THEREFORE**  
**; USING MONOCLONAL ANTIBODIES**

Inventors: Thorns Christopher J (GB)

Assignee: United Kingdom Agriculture Fisheries and Food Minister of GB

Assignee Code: 19430

	Publication Number	Kind	Date	Application Number	Date
	US 5510241	A	19960423	US 95449922	19950525
	(Cited in 003 later patents)				
Continuation of:	Abandoned .			US 9330208	19930326
Priority Applic:				GB 9021290	19901001
				GB 9022570	19901017
				GB 916546	19910327

Calculated Expiration: 20130423

Legal Status: **EXPIRED**

(See File 123 for legal status details)

**METHOD OF TESTING FOR THE PRESENCE OF SALMONELLA SEROTYPES EXPRESSING**  
**SALMONELLA ENTERITIDIS FIMBRIAL ANTIGEN (SEFA) AND REAGENTS THEREFORE**  
 ...

...USING MONOCLONAL ANTIBODIES

Abstract: A method of testing for the presence of Salmonella serotypes S. **enteritidis** and S. dublin is provided. Novel monoclonal **antibodies** are used to detect the presence of an epitope specific for these serotypes in cultures which have been grown on selected media which enhance the expression of said epitope in **fimbrial** sites. Test kits utilizing the

antigen or its epitopic parts, **antibodies** and/or the media are further provided.

Exemplary Claim: ...method of testing a sample for the presence of microorganisms for Salmonella serotypes expressing Salmonella **enteritidis** **fimbrial** antigen (SEFA) comprising the steps of: (a) exposing a sample suspected of containing the microorganisms, or SEFA to an **antibody** which specifically binds to the antigen specifically bound by the monoclonal **antibody** secreted by ECACC 90101101 or ECACC 90121902 or an **antibody** which specifically binds the epitope bound by the monoclonal **antibody** secreted by ECACC 90101101 or ECACC 90121902; (b) detecting **antibody** -antigen specific binding, wherein antigen-**antibody** specific binding is indicative of the presence of microorganisms selected from the group consisting of S. **enteritidis** , S. dublin, S. moscow and S. blegdam, and the absence of **antibody** -antigen specific binding is indicative of the absence of S. **enteritidis** .

Non-exemplary Claims: ...serotypes to an antibody which specifically binds to the antigen specifically bound by the monoclonal **antibody** secreted by ECACC 90101101 or ECACC 90121902 or an antibody which specifically binds the epitope...

...of containing the organisms into or onto a culture medium supporting the expression of Salmonella **enteritidis** **fimbrial** antigen; (b) culturing said sample in or on the culture medium; and (c) exposing a...

...specifically bound by the monoclonal antibody secreted by ECACC 90101101 or ECACC 90121902 or an **antibody** which specifically binds the epitope bound by the monoclonal **antibody** secreted by ECACC 90101101 or ECACC 90121902 and then detecting **antibody** -antigen specific binding wherein **antibody** -antigen specific binding is indicative of the presence of organisms of the group of Salmonella...

...screening candidate culture media for the ability to support the expression of SEFA by S. **enteritidis** or a SEFA-expressing strain of S. dublin, wherein the screening comprises culturing a sample of S. **enteritidis** or a SEFA-expressing strain of S. dublin in or on the candidate culture medium and exposing a second sample obtained from the culturing step to an **antibody** which specifically binds to the antigen specifically bound by the monoclonal **antibody** secreted by ECACC 90101101 or ECACC 90121902 or an **antibody** which specifically binds the epitope bound by the monoclonal **antibody** secreted by ECACC 90101101 or ECACC 90121902 and then detecting **antibody** -antigen specific binding wherein **antibody** -antigen specific binding is indicative of culture medium having the ability to support the expression...

...7. A method as claimed in claim 5 wherein the **antibody** is a monoclonal **antibody** expressed by one of the hybridoma cells deposited with the European Collection of Animal Cell...Salmonella serotypes expressing SEFA, said test kit comprising SEFA, wherein the SEFA specifically binds an **antibody** which specifically binds to the antigen specifically bound by the monoclonal **antibody** secreted by ECACC 90101101 or ECACC 90121902 or an **antibody** which specifically binds the epitope bound by the monoclonal **antibody** secreted by ECACC 90101101 or ECACC 90121902

...A test kit as claimed in claim 25 wherein the SEFA is obtained from S. **enteritidis** or S. dublin microorganisms...

...in claim 25 or claim 26 wherein the SEFA is in the form of detached  
**fimbriae** .

? logoff hold

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06jul05 09:46:57 User228206 Session D2460.5
$0.03      0.009 DialUnits File155
$0.03 Estimated cost File155
$0.16      0.027 DialUnits File5
$4.00      2 Type(s) in Format 9
$4.00      2 Types
$4.16 Estimated cost File5
$0.19      0.018 DialUnits File73
$2.94      1 Type(s) in Format 9
$2.94      1 Types
$3.13 Estimated cost File73
$1.15      0.243 DialUnits File349
$8.00      5 Type(s) in Format 3
$8.00      5 Types
$9.15 Estimated cost File349
$0.07      0.027 DialUnits File10
$2.70      2 Type(s) in Format 9
$2.70      2 Types
$2.77 Estimated cost File10
$0.11      0.009 DialUnits File399
$2.75      1 Type(s) in Format 3
$2.75      1 Types
$2.86 Estimated cost File399
$0.64      0.108 DialUnits File654
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$0.70      1 Types
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$0.06      0.027 DialUnits File203
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$2.90      2 Types
$2.96 Estimated cost File203
$0.05      0.009 DialUnits File348
$0.05 Estimated cost File348
$0.04      0.009 DialUnits File444
$0.04 Estimated cost File444
$0.03      0.009 DialUnits File143
$0.03 Estimated cost File143
$0.15      0.027 DialUnits File16
$3.45      1 Type(s) in Format 9
$3.45      1 Types
$3.60 Estimated cost File16
$0.19      0.009 DialUnits File357
$0.19 Estimated cost File357
$0.03      0.009 DialUnits File94
$0.03 Estimated cost File94
$0.04      0.009 DialUnits File98
$0.04 Estimated cost File98
$1.26      0.072 DialUnits File340
$1.51      1 Type(s) in Format 42
$1.51      1 Types
$2.77 Estimated cost File340
$0.07      0.018 DialUnits File65
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\$1.10 1 Type(s) in Format 9  
    \$1.10 1 Types  
\$1.17 Estimated cost File65  
      OneSearch, 18 files, 0.666 DialUnits FileOS  
\$0.26 TELNET  
\$36.99 Estimated cost this search  
\$36.99 Estimated total session cost 0.666 DialUnits

Logoff: level 05.05.00 D 09:46:57

Terminal set to DLINK  
? t s3/9/16 76

Set	Items	Description
S1	367	ENTERITIDIS? (100N) (FIMBRIA? OR FLAGELL? OR PILIN? OR PIL-I?) (100N) (IMMUNE OR ANTISER? OR ANTIBOD? OR IMMUNOGLOB?)
S2	193	RD (unique items)
S3	91	S2/1999:2005
S4	102	S2 NOT S3
S5	193	S2/PATENTS
S6	102	S2 NOT S3

? t s3/9/16 76

3/9/16 (Item 16 from file: 155)

DIALOG(R) File 155:MEDLINE(R)

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14316799 PMID: 12133620

**Surface plasmon resonance (BIAcore) detection of serum antibodies against Salmonella enteritidis and Salmonella typhimurium.**

Jongerijs-Gortemaker Betty G M; Goverde Roos L J; van Knapen Frans; Bergwerff Aldert A

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Record type: MEDLINE; Completed

Subfile: INDEX MEDICUS

We have used a surface plasmon resonance biosensor (BIAcore 3000) to detect serum **antibodies** in chickens having current or recent infections. Three well-defined *Salmonella* **flagellar** recombinant DNA antigens reflecting *Salmonella* **enteritidis** (H:g,m **flagellin**) and *Salmonella* **typhimurium** (H:i and H:1,2 **flagellins**) expressed in *Escherichia coli* were each immobilized in a single flow cell of a biosensor chip. Glutathione-S-transferase was immobilized on the surface of another flow cell to monitor non-specific binding. Sera collected from chickens with no history of *Salmonella* infection, and from chickens infected with *Salmonella* serotypes *infantis*, *pullorum*, *gallinarum* were used to test the performance of the system. The sensitivity exhibited to a range up to 900 arbitrary response units (RU) for the most positive *S. typhimurium* serum at a dilution of 1/40. Sera from *Salmonella* *infantis*, *Salmonella* *pullorum* and *Salmonella* *gallinarum* infected birds gave responses less than the cut-off point, which was determined as the averaged response of sera from specific pathogen-free chickens plus three times the standard deviation. A positive response was obtained when these sera and whole blood were fortified with *S. enteritidis* and *S. typhimurium* positive serum. The sensitivity, specificity, precision and reproducibility obtained suggested that this approach could be used for detecting past or present infection with a range of pathogens in animals.

Tags: Research Support, Non-U.S. Gov't

Descriptors: \*Antibodies, Bacterial--blood--BL; \*Salmonella Infections --diagnosis--DI; \*Salmonella enteritidis--immunology--IM; \*Salmonella typhimurium--immunology--IM; \*Surface Plasmon Resonance--methods--MT; Animals; Antigens, Bacterial--immunology--IM; Chickens; Kinetics;

Reproducibility of Results; Sensitivity and Specificity

CAS Registry No.: 0 (Antibodies, Bacterial); 0 (Antigens, Bacterial)

Record Date Created: 20020722

Record Date Completed: 20020925

3/9/76 (Item 2 from file: 35)

DIALOG(R)File 35:Dissertation Abs Online

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02003394 ORDER NO: AADAA-IMQ89484

**Chicken egg yolk antibodies specific for *Salmonella enteritidis* and *Salmonella typhimurium* against experimental salmonellosis in mice**

Author: Fang, Lin

Degree: M.Sc.

Year: 2003

Corporate Source/Institution: The University of Manitoba (Canada) (0303)

Adviser: Gary Crow

Source: VOLUME 42/05 of MASTERS ABSTRACTS.

PAGE 1588. 84 PAGES

Descriptors: AGRICULTURE, ANIMAL CULTURE AND NUTRITION ; BIOLOGY, MICROBIOLOGY

Descriptor Codes: 0475; 0410

ISBN: 0-612-89484-3

The study describes procedures that were used to isolate and purify three high purity antigens [outer membrane proteins (OMP), lipopolysaccharide (LPS) and **fimbriae** (FIM)] from *Salmonella typhimurium* and *S. enteritidis*. Polyclonal **antibodies** were produced in chickens immunized with the three antigens. The efficacy of purified chicken egg yolk homotypic **antibodies** specific for OMP, LPS or FIM in controlling experimental salmonellosis in mice was investigated. Mice were challenged orally with  $1.5 \times 10^9$  colony forming units (c.f.u.) of *Salmonella enteritidis* or  $1 \times 10^9$  c.f.u. of *S. typhimurium* and then orally treated with 0.2 ml of high titer anti-OMP, -LPS or -FIM yolk **antibodies** 30 min after the challenge and then once each on the following two days. In mice challenged with *S. enteritidis*, **antibody** treatment resulted in survival rates of 69.2, 46.2 and 40% using OMP, LPS or FIM specific **antibodies**, respectively, in contrast to only 15.4% in control mice ( $p < 0.05$ ). In the *S. typhimurium* trial, survival rates were 76.9, 58.3 and 36.4% using OMP, LPS or FIM specific **antibodies**, respectively, in contrast to 0% in the control mice ( $p < 0.05$ ). *In vitro* adhesion of *S. enteritidis* and *S. typhimurium* to HeLa cells was significantly ( $p < 0.05$ ) reduced by each of the anti-OMP, -LPS, and -FIM homotypic **antibodies**. The results demonstrate that egg yolk **antibodies** specific for *Salmonella* OMP, LPS, or FIM will passively protect mice from experimental salmonellosis when administered orally. Of these **antibodies**, anti-OMP exhibited the highest level of protection *in vivo* and *in vitro*. Other animals and aves may also be protected against salmonellosis by the same **antibodies**, either singly or combined.

? t s3/3/48 52 53 59 62 71 85 86 88 90 91

3/3/48 (Item 4 from file: 349)

DIALOG(R)File 349:PCT FULLTEXT

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01100391      \*\*Image available\*\*

**FLAGELLIN PEPTIDES AS ADJUVANTS FOR VACCINES**

**ADJUVANTS**

Patent Applicant/Assignee:

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KRAEHNBUHL Jean-Pierre, Sur-la-Croix, CH-1812 Rivax, CH, CH (Residence), CH (Nationality), (Designated only for: US)

Legal Representative:

DOLAN Anthony Patrick (agent), BTG International Limited, 10 Fleet Place, Limeburner Lane, London EC4M 7SB, GB,

Patent and Priority Information (Country, Number, Date):

Patent: WO 200422092 A2-A3 **20040318** (WO 0422092)

Application: WO 2003GB3797 20030903 (PCT/WO GB03003797)

Priority Application: US 2002407294 20020903

Designated States:

(Protection type is "patent" unless otherwise stated - for applications prior to 2004)

AE AG AL AM AT AU AZ BA BB BG BR BY BZ CA CH CN CO CR CU CZ DE DK DM DZ  
EC EE ES FI GB GD GE GH GM HR HU ID IL IN IS JP KE KG KP KR KZ LC LK LR  
LS LT LU LV MA MD MG MK MN MW MX MZ NI NO NZ OM PG PH PL PT RO RU SC SD  
SE SG SK SL SY TJ TM TN TR TT TZ UA UG US UZ VC VN YU ZA ZM ZW  
(EP) AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HU IE IT LU MC NL PT RO SE  
SI SK TR  
(OA) BF BJ CF CG CI CM GA GN GQ GW ML MR NE SN TD TG  
(AP) GH GM KE LS MW MZ SD SL SZ TZ UG ZM ZW  
(EA) AM AZ BY KG KZ MD RU TJ TM

Publication Language: English

Filing Language: English

Fulltext Word Count: 10151

3/3/52      (Item 8 from file: 349)

DIALOG(R) File 349:PCT FULLTEXT

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00769351      \*\*Image available\*\*

**IMMUNO-DIAGNOSTIC TEST METHOD FOR VETERINARY DISEASE**

**METHODE DE TEST D'IMMUNODIAGNOSTIC POUR MALADIE VETERINAIRE**

Patent Applicant/Assignee:

INSTITUTE OF MOLECULAR AGROBIOLOGY, The National University of Singapore, 1 Research Link, Singapore 117604, SG, SG (Residence), SG (Nationality), (For all designated states except: US )

INSTITUTE OF MATERIALS RESEARCH AND ENGINEERING, The National University of Singapore, S7 Level 3, Singapore 119260, SG, SG (Residence), SG (Nationality), (For all designated states except: US )

Patent Applicant/Inventor:

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SG (Residence), SG (Nationality), (Designated only for: US )  
LIU Wei, Block 11, #06-110, Red Hill Close, Singapore 151011, SG, SG  
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Legal Representative:

ELLA CHEONG & G MIRANDAH, P.O. Box 0931, Raffles City, Singapore 911732,  
SG

Patent and Priority Information (Country, Number, Date):

Patent: WO 200102858 A1 20010111 (WO 0102858)

Application: WO 99SG98 19991004 (PCT/WO SG9900098)

Priority Application: SG 993147 19990705

Designated States:

(Protection type is "patent" unless otherwise stated - for applications  
prior to 2004)

AE AL AM AT AU AZ BA BB BG BR BY CA CH CN CU CZ DE DK EE ES FI GB GD GE  
GH GM HR HU ID IL IN IS JP KE KG KP KR KZ LC LK LR LS LT LU LV MD MG MK  
MN MW MX NO NZ PL PT RO RU SD SE SI SK SL TJ TM TR TT UA UG US UZ VN YU  
ZA ZW

(EP) AT BE CH CY DE DK ES FI FR GB GR IE IT LU MC NL PT SE

(OA) BF BJ CF CG CI CM GA GN GW ML MR NE SN TD TG

(AP) GH GM KE LS MW SD SL SZ TZ UG ZW

(EA) AM AZ BY KG KZ MD RU TJ TM

Publication Language: English

Filing Language: English

Fulltext Word Count: 12259

3/3/53 (Item 9 from file: 349)

DIALOG(R)File 349:PCT FULLTEXT

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00766777

**DETECTION OF SALMONELLA ENTERITIDIS**

**DETECTION DE SALMONELLA ENTERITIDIS**

Patent Applicant/Assignee:

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1 Research Link, Singapore 117604, SG, SG (Residence), SG (Nationality)  
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Legal Representative:

ELLA CHEONG & G MIRANDAH, P.O. Box 0931, Raffles City, Singapore 911732,  
SG

Patent and Priority Information (Country, Number, Date):

Patent: WO 200078995 A1 20001228 (WO 0078995)

Application: WO 99SG61 19990622 (PCT/WO SG9900061)

Designated States:

(Protection type is "patent" unless otherwise stated - for applications  
prior to 2004)

AE AL AM AT AU AZ BA BB BG BR BY CA CH CN CU CZ DE DK EE ES FI GB GD GE  
GH GM HR HU ID IL IN IS JP KE KG KP KR KZ LC LK LR LS LT LU LV MD MG MK

MN MW MX NO NZ PL PT RO RU SD SE SG SI SK SL TJ TM TR TT UA UG US UZ VN  
YU ZA ZW

(EP) AT BE CH CY DE DK ES FI FR GB GR IE IT LU MC NL PT SE

(OA) BF BJ CF CG CI CM GA GN GW ML MR NE SN TD TG

(AP) GH GM KE LS MW SD SL SZ UG ZW

(EA) AM AZ BY KG KZ MD RU TJ TM

Publication Language: English

Filing Language: English

Fulltext Word Count: 8805

3/3/59 (Item 1 from file: 399)

DIALOG(R) File 399:CA SEARCH(R)

(c) 2005 American Chemical Society. All rts. reserv.

134307678 CA: 134(22)307678b JOURNAL

Analysis of expression of flagella by Salmonella enterica serotype  
Typhimurium by monoclonal antibodies recognizing both phase specific and  
common epitopes

AUTHOR(S): Sojka, M.; Sayers, A. R.; Woodward, M. J.

LOCATION: Department of Bacterial Diseases, Veterinary Laboratory Agency  
(Weybridge), Addlestone, Surrey, UK, KT15 3NB

JOURNAL: Vet. Microbiol. DATE: 2001 VOLUME: 78 NUMBER: 1 PAGES: 61-77

CODEN: VMICDQ ISSN: 0378-1135 PUBLISHER ITEM IDENTIFIER:

0378-1135(00)00291-1 LANGUAGE: English PUBLISHER: Elsevier Science B.V.

3/3/62 (Item 4 from file: 399)

DIALOG(R) File 399:CA SEARCH(R)

(c) 2005 American Chemical Society. All rts. reserv.

130351229 CA: 130(26)351229x PATENT

Detection of Salmonella typhimurium via antibodies to epitopes within the  
flagellin protein

INVENTOR(AUTHOR): Berry, Mark John; Metcalfe, Mark Andrew; Parry, Steven  
H.

LOCATION: Neth.

ASSIGNEE: Unilever N.V.; Unilever PLC

PATENT: European Pat. Appl. ; EP 915158 A2 DATE: 19990512

APPLICATION: EP 98203646 (19981028) \*EP 97308838 (19971104)

PAGES: 17 pp. CODEN: EPXXDW LANGUAGE: English CLASS: C12N-015/13A;  
C07K-016/12B; C12N-005/20B; A61K-039/112B; G01N-033/569B; G01N-033/577B;  
C07K-014/255B DESIGNATED COUNTRIES: AT; BE; CH; DE; DK; ES; FR; GB; GR; IT  
; LI; LU; NL; SE; MC; PT; IE; SI; LT; LV; FI; RO

3/3/71 (Item 9 from file: 654)

DIALOG(R) File 654:US Pat.Full.

(c) Format only 2005 The Dialog Corp. All rts. reserv.

4797335 \*\*IMAGE Available

Derwent Accession: 1998-120780

Utility

C/ Recombinant Sef14 fimbrial protein from Salmonella

; REACTING A SAMPLE OBTAINED FROM POULTRY WITH A TRUNCATED SEF14 ANTIGEN  
TO PERMIT ANTI-SALMONELLA ENTERITIDIS ANTIBODIES TO BIND ANTIGEN;

PRESENCE OF ANTIBODY /ANTIGEN BINDING COMPLEX INDICATES INFECTION

Inventor: Rajashekara, Gireesh, St. Paul, MN

Nagaraja, Kakambi V., Roseville, MN  
 Kapur, Vivek, St. Anthony, MN  
 Assignee: Regents of the University of Minnesota(02), Minneapolis, MN  
 Minnesota, University of Regents (Code: 56024)  
 Examiner: Swartz, Rodney P (Art Unit: 161)  
 Law Firm: Merchant & Gould P.C.

	Publication Number	Kind	Date	Application Number	Filing Date
Main Patent	US 6495334	A	20021217	US 99230078	19990520
PCT	WO 9803656		19980129	WO 97US12639	19970718
		371:			
		102e:			

Fulltext Word Count: 4524

3/3/85 (Item 5 from file: 348)  
 DIALOG(R) File 348:EUROPEAN PATENTS  
 (c) 2005 European Patent Office. All rts. reserv.

01025019

Improvements in or relating to detection of salmonella  
 Verbesserungen im oder mit Bezug auf den Nachweis von Salmonella  
 Ameliorations en ce qui concerne la detection de Salmonella

PATENT ASSIGNEE:

UNILEVER N.V., (200910), P.O. Box 760, 3000 DK Rotterdam, NL\ (Applicant  
 designated states: , CH; DE; ES; FR; IT; LI; NL; SE)

UNILEVER PLC, (200929), Unilever House Blackfriars P.O. Box 68, London  
 EC4P 4BQ, GB\ (Applicant designated states: , GB)

INVENTOR:

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 Bedford MK44 1LQ, (GB)

Metcalfe, Mark Andrew, 106 Ashtree Road, Bitterne Park, Southampton,  
 Hampshire SO18 1LZ, (GB)

Parry, Steven H., Unilever Research Colworth, Colworth House, Sharnbrook,  
 Bedford MK44 1LQ, (GB)

LEGAL REPRESENTATIVE:

Ebner von Eschenbach, Jennifer et al (92001), Ladas & Parry,  
 Dachauerstrasse 37, 80335 Munchen, (DE)

PATENT (CC, No, Kind, Date): EP 915158 A2 990512 (Basic)  
 EP 915158 A3 991020

APPLICATION (CC, No, Date): EP 98203646 981028;

PRIORITY (CC, No, Date): EP 97308838 971104

DESIGNATED STATES: CH; DE; ES; FR; GB; IT; LI; NL

EXTENDED DESIGNATED STATES: AL; LT; LV; MK; RO; SI

INTERNATIONAL PATENT CLASS: C12N-015/13; C07K-016/12; C12N-005/20;  
 A61K-039/112; G01N-033/569; G01N-033/577; C07K-014/255

ABSTRACT WORD COUNT: 55

NOTE:

Figure number on first page: NONE

LANGUAGE (Publication,Procedural,Application): English; English; English  
 FULLTEXT AVAILABILITY:

Available Text	Language	Update	Word Count
CLAIMS A	(English)	9922	1121
SPEC A	(English)	9922	6331

Total word count - document A 7452  
Total word count - document B 0  
Total word count - documents A + B 7452

**3/3/86 (Item 6 from file: 348)**

DIALOG(R)File 348:EUROPEAN PATENTS

(c) 2005 European Patent Office. All rts. reserv.

00509113

**METHOD OF TESTING FOR SALMONELLA**

**VERFAHREN ZUR PRUFUNG FUR SALMONELLA**

**PROCEDE DE DEPISTAGE DE LA SALMONELLE**

PATENT ASSIGNEE:

THE MINISTER OF AGRICULTURE FISHERIES AND FOOD IN HER BRITANNIC MAJESTY'S  
GVT. OF THE U. K. OF GREAT BRITAIN AND N. IRELAND, (819069), Whitehall  
Place, London SW1A 2HH, (GB), (Proprietor designated states: all)

INVENTOR:

THORNS, Christopher; John 11 Lincoln Drive, Pyrford, Woking Surrey GU22  
8RL, (GB)

LEGAL REPRESENTATIVE:

Greaves, Carol Pauline et al (50416), Batchellor, Kirk & Co. 102-108  
Clerkenwell Road, London EC1M 5SA, (GB)

PATENT (CC, No, Kind, Date): EP 551325 A1 930721 (Basic)  
EP 551325 B1 000315  
WO 9206197 920416

APPLICATION (CC, No, Date): EP 91917128 911001; WO 91GB1690 911001

PRIORITY (CC, No, Date): GB 9021290 901001; GB 9022570 901017; GB 9106546  
910327

DESIGNATED STATES: AT; BE; CH; DE; DK; ES; FR; GB; GR; IT; LI; LU; NL; SE

INTERNATIONAL PATENT CLASS: C12N-015/31; C12N-015/62; G01N-033/569;

C12N-001/20; C12P-021/08

NOTE:

No A-document published by EPO

LANGUAGE (Publication,Procedural,Application): English; English; English

FULLTEXT AVAILABILITY:

Available Text	Language	Update	Word Count
CLAIMS B	(English)	200011	1205
CLAIMS B	(German)	200011	1124
CLAIMS B	(French)	200011	1312
SPEC B	(English)	200011	9178

Total word count - document A 0

Total word count - document B 12819

Total word count - documents A + B 12819

**3/3/88 (Item 1 from file: 357)**

DIALOG(R)File 357:Derwent Biotech Res.

(c) 2005 Thomson Derwent & ISI. All rts. reserv.

0345506 DBR Accession No.: 2004-17798 PATENT

**Salmonella antigen formulation useful for identifying SE-infected fowl and  
fowl inoculated with SE-attenuated vaccine, comprising Salmonella  
enteritidis flagellin 9 kDa polypeptide - bacterium protein antigen and  
immunization in fowl for attenuated vaccine and infection therapy**

AUTHOR: OHTA H; EKAWA T; TOYATA Y; YAMAMOTO S

PATENT ASSIGNEE: CAF LAB INC 2004

PATENT NUMBER: WO 200455045 PATENT DATE: 20040701 WPI ACCESSION NO.:

2004-517400 (200449)

PRIORITY APPLIC. NO.: WO 200213148 APPLIC. DATE: 20021216  
NATIONAL APPLIC. NO.: WO 2002JP13148 APPLIC. DATE: 20021216  
LANGUAGE: Japanese

3/3/90 (Item 1 from file: 340)

DIALOG(R) File 340:CLAIMS(R)/US Patent  
(c) 2005 IFI/CLAIMS(R). All rts. reserv.

10021379 2001-0021386 2001-0005641

**C/SALMONELLA VACCINE; INDUCING ANTIBODIES AGAINST FLAGELLIN OR FLAGELLA**

Inventors: Nuijten Petrus Johannes Maria (NL); Witvliet Maarten Hendrik (NL)

Assignee: Unassigned Or Assigned To Individual

Assignee Code: 68000

	Publication Number	Kind	Date	Application Number	Date
Priority Applic:	US 20010021386	A1	20010913	US 2000749025	20001227
				EP 99204564	19991228

3/3/91 (Item 2 from file: 340)

DIALOG(R) File 340:CLAIMS(R)/US Patent  
(c) 2005 IFI/CLAIMS(R). All rts. reserv.

3801414 0245501

**C/RECOMBINANT SEF14 FIMBRIAL PROTEIN FROM SALMONELLA; REACTING A SAMPLE  
OBTAINED FROM POULTRY WITH A TRUNCATED SEF14 ANTIGEN TO PERMIT  
ANTI-SALMONELLA ENTERITIDIS ANTIBODIES TO BIND ANTIGEN; PRESENCE OF  
ANTIBODY /ANTIGEN BINDING COMPLEX INDICATES INFECTION**

Inventors: Kapur Vivek (US); Nagaraja Kakambi V (US); Rajashekara Gireesh (US)

Assignee: Minnesota, University of Regents

Assignee Code: 56024

	Publication Number	Kind	Date	Application Number	Date
Internat. Convent.:	US 6495334	B1	20021217	US 99230078	19990520
	WO 9803656		19980129	WO 97US12639	19970718
				Section 371:	19990520
				Section 102(e):	19990520
Priority Applic:				US 99230078	19990520
Provisional Applic:				US 60-22191	19960719

Calculated Expiration: 20170718

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\$0.09 0.026 DialUnits File155

\$0.21 1 Type(s) in Format 9

\$0.21 1 Types

\$0.30 Estimated cost File155

\$0.08 0.013 DialUnits File5

\$0.08 Estimated cost File5

\$0.14 0.013 DialUnits File73

\$0.14 Estimated cost File73

\$0.38 0.079 DialUnits File349

\$4.80 3 Type(s) in Format 3

\$4.80 3 Types  
 \$5.18 Estimated cost File349  
 \$0.04 0.013 DialUnits File10  
 \$0.04 Estimated cost File10  
 \$0.33 0.026 DialUnits File399  
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 \$5.50 2 Types  
 \$5.83 Estimated cost File399  
 \$0.31 0.053 DialUnits File654  
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 \$0.70 1 Types  
 \$1.01 Estimated cost File654  
 \$0.11 0.026 DialUnits File35  
 \$2.30 1 Type(s) in Format 9  
 \$2.30 1 Types  
 \$2.41 Estimated cost File35  
 \$0.03 0.013 DialUnits File203  
 \$0.03 Estimated cost File203  
 \$0.21 0.040 DialUnits File348  
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 \$3.61 Estimated cost File348  
 \$0.06 0.013 DialUnits File444  
 \$0.06 Estimated cost File444  
 \$0.04 0.013 DialUnits File143  
 \$0.04 Estimated cost File143  
 \$0.07 0.013 DialUnits File16  
 \$0.07 Estimated cost File16  
 \$0.55 0.026 DialUnits File357  
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 \$3.00 Estimated cost File357  
 \$0.05 0.013 DialUnits File94  
 \$0.05 Estimated cost File94  
 \$0.06 0.013 DialUnits File98  
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 \$3.02 2 Type(s) in Format 42  
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 \$3.71 Estimated cost File340  
 \$0.05 0.013 DialUnits File65  
 \$0.05 Estimated cost File65  
 OneSearch, 18 files, 0.448 DialUnits FileOS  
 \$0.26 TELNET  
 \$25.93 Estimated cost this search  
 \$25.93 Estimated total session cost 0.448 DialUnits

Logoff: level 05.05.00 D 09:55:12

Med Microbiol. 1998 Jun;47(6):489-97.

[Related Articles, Links](#)

### **SERE, a widely dispersed bacterial repetitive DNA element.**

**Rajashekara G, Koeuth T, Nevile S, Back A, Nagaraja KV, Lupski JR, Kapur V.**

Department of Veterinary Pathobiology, University of Minnesota, St Paul 55108, USA.

The presence of a *Salmonella* serotype Enteritidis repeat element (SERE) located within the upstream regulatory region of the *sefABCD* operon encoding fimbrial proteins is reported. DNA dot-blot hybridisation analyses and computerised searches of genetic databases indicate that SERE is well conserved and widely distributed throughout the bacterial and archaeal kingdoms. A SERE-based polymerase chain reaction (SERE-PCR) assay was developed to fingerprint 54 isolates of Enteritidis representing nine distinct phage types and 54 isolates of other *Salmonella* serotypes. SERE-PCR identified five distinct fingerprint profiles among the 54 Enteritidis isolates; no correlation between phage types and SERE-PCR fingerprint patterns was noticed. SERE-PCR was reproducible, rapid and easy to perform. The results of this investigation suggest that the limited heterogeneity of SERE-PCR fingerprint patterns can be utilised to develop serotype- and serogroup-specific fingerprint patterns for isolates of Enteritidis.

PMID: 9879967 [PubMed - indexed for MEDLINE]

1: J Med Microbiol. 1998 Jun;47(6):489-97.

[Related Articles, Links](#)

### **SERE, a widely dispersed bacterial repetitive DNA element.**

**Rajashekara G, Koeuth T, Nevile S, Back A, Nagaraja KV, Lupski JR, Kapur V.**

Department of Veterinary PathoBiology, University of Minnesota, St Paul 55108, USA.

The presence of a Salmonella serotype Enteritidis repeat element (SERE) located within the upstream regulatory region of the sefABCD operon encoding fimbrial proteins is reported. DNA dot-blot hybridisation analyses and computerised searches of genetic databases indicate that SERE is well conserved and widely distributed throughout the bacterial and archaeal kingdoms. A SERE-based polymerase chain reaction (SERE-PCR) assay was developed to fingerprint 54 isolates of Enteritidis representing nine distinct phage types and 54 isolates of other Salmonella serotypes. SERE-PCR identified five distinct fingerprint profiles among the 54 Enteritidis isolates; no correlation between phage types and SERE-PCR fingerprint patterns was noticed. SERE-PCR was reproducible, rapid and easy to perform. The results of this investigation suggest that the limited heterogeneity of SERE-PCR fingerprint patterns can be utilised to develop serotype- and serogroup-specific fingerprint patterns for isolates of Enteritidis.

PMID: 9879967 [PubMed - indexed for MEDLINE]

Infect. Immun., Dec 1994, 5376-5383, Vol 62, No. 12  
Copyright © 1994, American Society for Microbiology

## **A *Salmonella enteritidis* 11RX pilin induces strong T-lymphocyte responses**

**AD Ogunniyi, PA Manning and I Kotlarski**

Department of Microbiology and Immunology, University of Adelaide, Australia.

Our previous work, using proteins fractionated by sodium dodecyl sulfate-polyacrylamide gel electrophoresis to define antigens of *Salmonella enteritidis* 11RX able to stimulate T cells from *S. enteritidis* 11RX-primed (BALB/c x C57BL/6)F1 mice, had indicated the presence of a major antigenic determinant of 14 to 18 kDa (H.-M. Vordermeier and I. Kotlarski, *Immunol. Cell. Biol.* 68:299-305, 1990). The 14-kDa size is similar to that of the monomeric units of one of the fimbrial structures, SEF14, produced by a human enteropathogen, *S. enteritidis* 27655 (J. Feutrier, W. W. Kay, and T. J. Trust, *J. Bacteriol.* 168:221-227, 1986). Here we present data which indicate that *S. enteritidis* 11RX also produces this protein and that it is able to elicit delayed-type hypersensitivity reactions in *S. enteritidis* 11RX-primed animals and to stimulate in vitro proliferation of, and cytokine release from, T cells obtained from these animals, implying that this fimbrial protein is likely to be an important immunogen of *S. enteritidis*. The protein was purified to homogeneity and is free from contamination with lipopolysaccharide. Standard immunoblot analysis with unabsorbed *S. enteritidis* 11RX antiserum and antiserum absorbed with *Salmonella typhimurium* C5 and various strains of *Escherichia coli*, as well as a panel of anti-14-kDa-protein monoclonal antibodies, suggests that this fimbrial protein is not the common antigen expressed by a number of organisms belonging to the family Enterobacteriaceae. Immunogold electron microscopy with one of these monoclonal antibodies confirms that the 14-kDa protein and SEF14 are identical.

J. Bacteriol., 05 1993, 2523-2533, Vol 175, No. 9  
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## Characterization of three fimbrial genes, sefABC, of *Salmonella enteritidis*

**SC Clouthier, KH Muller, JL Doran, SK Collinson and WW Kay**

Department of Biochemistry and Microbiology, University of Victoria, British Columbia, Canada.

*Salmonella enteritidis* produces thin, filamentous fimbriae designated SEF14. A 3.9-kb region of a 5.3-kb fragment encoding genes responsible for SEF14 biosynthesis was sequenced and found to contain three genes, sefABC. sefA encoded a novel fimbrin, the structural subunit of SEF14 fimbriae. sefB and sefC encoded proteins homologous to *Escherichia coli* and *Klebsiella pneumoniae* fimbrial periplasmic chaperone proteins and fimbrial outer membrane proteins, respectively, and are the first such genes to be characterized from *Salmonella* spp. in vitro expression directed by the 5.3-kb DNA fragment identified SefA, SefB, and SefC as approximately 14,000-, 28,000-, and 90,000-M(r) proteins, respectively, which correlated with their predicted amino acid sequences. sefB and sefC were not expressed in the absence of sefA. Primer extension analysis of sefABC revealed two major transcription start sites located upstream of sefA. Transcription of sefBC also initiated from the sefA promoter region. Secondary-structure analysis of the mRNA transcript for sefABC predicted the formation of two stable stem-loop structures in the intercistronic region between sefA and sefB indicative of differential regulation of SefA, SefB, and SefC translation. *E. coli* cells carrying the 5.3-kb DNA fragment of *S. enteritidis* DNA were unable to assemble distinguishable SEF14 fimbriae; however, immunogold-labelled SEF14 fimbriae were displayed on *E. coli* clones containing a 44-kb DNA fragment which encompassed the 5.3-kb region. Therefore, sefABC genes make up part of a complex sef operon responsible for the expression and assembly of SEF14 fimbriae.

the SEF14 fimbrial antigen of *Salmonella enteritidis* (Thorns et al. (1996) Microb. Pathog. 20: 235-246);

0558783 PMID: 8155478

**The use of latex particle agglutination to specifically detect Salmonella enteritidis .**

Thorns C J; McLaren I M; Sojka M G

Department of Bacteriology, Central Veterinary Laboratory, New Haw, Addlestone, Surrey, England, UK.

International journal of food microbiology (NETHERLANDS) Jan 1994, 21 (1-2) p47-53, ISSN 0168-1605 Journal Code: 8412849

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Document type: Journal Article; Review; Review, Tutorial

Languages: ENGLISH

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Subfile: INDEX MEDICUS

This paper reviews the development and evaluation of a latex particle agglutination test to specifically identify cultured *Salmonella enteritidis* organisms. The test is based on the use of two monoclonal antibody-coated latex reagents, one of which detects the recently discovered SEF14 fimbriae expressed predominantly by *S. enteritidis* and *S. dublin* organisms, while the second reagent detects the H'p' antigen of *S. dublin* flagella . In a series of field trials 141 out of 142 strains of *S. enteritidis* from eighteen phage types were correctly identified by the latex test. A further 175 salmonella isolates representing 35 serotypes were tested and only two false-positives (*S. dublin*) in the latex test were recorded. This is the first rapid serotype specific test for *S. enteritidis* to be developed, and highlights the potential advantage of fimbrial antigens as novel diagnostic antigens of the future. (13 Refs.)

Descriptors: \*Latex Fixation Tests; \* *Salmonella* Food Poisoning --microbiology--MI; \* *Salmonella enteritidis* --isolation and purification --IP; Animals; Humans; *Salmonella* Food Poisoning --diagnosis--DI; *Salmonella enteritidis* --classification --CL; Sensitivity and Specificity ; Serotyping

Record Date Created: 19940519

Record Date Completed: 19940519

13378745 PMID: 10334592

**Effect of pH, temperature and surface contact on the elaboration of fimbriae and flagella by Salmonella serotype Enteritidis .**

Walker S L; Sojka M; Dibb-Fuller M; Woodward M J

Bacteriology Department, Central Veterinary Laboratory, Addlestone, Surrey.

Journal of medical microbiology (ENGLAND) Mar 1999, 48 (3) p253-61, ISSN 0022-2615 Journal Code: 0224131

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Document type: Journal Article

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Record type: MEDLINE; Completed

Subfile: INDEX MEDICUS

Survival of enteric pathogens exposed to various environmental stresses depends upon a number of protective responses, some of which are associated with induction of virulence determinants. **Flagella** and **fimbriae** are putative virulence determinants of *Salmonella* spp. and ELISAs specific for the detection of **flagella** and SEF21, SEF14 and SEF17 **fimbriae** were used to assess the effect of temperature and pH upon their elaboration by isolates of *Salmonella* serotype **Enteritidis** in planktonic growth and on the surface of two-dimensional gradient agar plates. For three phage type 4 isolates of **Enteritidis** of comparative clinical provenance, similar phenotypes for the elaboration of these surface antigens were observed. SEF14 **fimbriae** were elaborated in planktonic growth at 37 degrees C, but not 20 degrees C, at pH 4.77 and above but not at pH 4.04; whereas on agar gradient plates SEF14 **fimbriae** were elaborated poorly but with best yields at pH 4.04. SEF17 **fimbriae** were elaborated in planktonic growth at 20 degrees C, but not at 37 degrees C, at pH 6.18 and above but not at pH 5.09 or below; whereas on agar gradient plates SEF17 **fimbriae** were elaborated well even at pH 4.65. SEF21 **fimbriae** were expressed very poorly under all conditions tested. Planktonic growth at 37 degrees C induced least **flagella** whereas growth at 20 degrees C, and particularly surface growth at lower pH values, induced a 'hyper-flagellate' phenotype. Single colonies allowed to form on gradient agar plates were shown to generate different colonial morphologies which were dependent on initial pH. These results demonstrate that the physicochemical environment is an important determinant of bacterial response, especially the induction of putative virulence factors.

Tags: Research Support, Non-U.S. Gov't

Descriptors: \*Antigens, Bacterial; \* **Fimbriae** Proteins; \* **Fimbriae** , Bacterial--metabolism--ME; \* **Flagella** --metabolism--ME; \*Hydrogen-Ion Concentration; \* **Salmonella enteritidis** --growth and development --GD; \*Temperature; Animals; Bacterial Proteins--metabolism--ME; Culture Media; Enzyme-Linked Immunosorbent Assay; **Salmonella enteritidis** --metabolism --ME; **Salmonella enteritidis** --ultrastructure --UL; Surface Properties

CAS Registry No.: 0 (Antigens, Bacterial); 0 (Bacterial Proteins); 0 (Culture Media); 0 (SEF21 protein, *Salmonella enteritidis*); 0 (sefA protein, *Salmonella enteritidis*); 147680-16-8 (Fimbriae Proteins)

Record Date Created: 19990602

Record Date Completed: 19990602

J Vét Diagn Invest. 1996 Jul;8(3):310-4.

[Related Articles, Links](#)

**A dot immunobinding assay (dot-ELISA) for the rapid serodiagnosis of *Salmonella enteritidis* infection in chickens.**

**Charles SD, Sreevatsan S, Bey RF, Sivanandan V, Halvorson DA, Nagaraja KV.**

Department of Veterinary Pathobiology, College of Veterinary Medicine, University of Minnesota, St. Paul 55108, USA.

A dot immunobinding assay (DIA) was developed for the detection of antibodies to *Salmonella enteritidis*. Western blot analysis of outer membrane proteins from SE identified 2 polypeptides of molecular masses 43 and 46 kD that were specific for *S. enteritidis*. These 2 polypeptides were utilized as antigens in the DIA. The DIA was tested on sera from chickens experimentally infected with *S. enteritidis*. Results of the DIA were compared with that of conventional microagglutination and serum plate tests. The DIA was a highly specific and sensitive test that can be useful for screening birds to determine if they are infected with *S. enteritidis*. Its simplicity, reliability, reproducibility, and speed in interpreting the assay results makes it a useful screening test for flock monitoring.


PMID: 8844573 [PubMed - indexed for MEDLINE]

Biochim Biophys Acta. 1998 Sep 8;1387(1-2):355-68.


Related Articles, Links

**Periplasmic and fimbrial SefA from *Salmonella enteritidis*.****Clouthier SC, Collinson SK, Lippert D, Ausio J, White AP, Kay WW.**

Department of Biochemistry and Microbiology, Petch Building, University of Victoria, P.O. Box 3055, Victoria, B.C. V8W 3P6, Canada.



*Salmonella enteritidis* produces thin, filamentous fimbriae composed of the fimbrin subunit SefA. Although insoluble in most detergents and chaotropic agents, these fimbriae were soluble at pH 10.5. Furthermore, in sodium dodecyl sulfate, these fibers depolymerized into monomers, dimers and other multimers of SefA, which precipitated on removal of the detergent. In contrast, unassembled periplasmic SefA fimbrins purified from *Escherichia coli* expressing cloned *sefA* and *sefB* were readily soluble in aqueous solution. Fimbrial and periplasmic SefA also differed in their reaction with an anti-SEF14 monoclonal antibody and in their surface hydrophobicity, indicating that the two forms had different properties. Precise mass measurements of periplasmic and fimbrial SefA by mass spectroscopy showed that these variations were not due to post-translational modifications. Periplasmic SefA consisted primarily of intact as well as some N-terminally truncated forms. The main 24 amino acid, N-terminally truncated form of periplasmic SefA was present as a 12.2 kDa monomer which had a low tendency to dimerize whereas intact periplasmic SefA was present as a 34.1 kDa homodimer. Intact periplasmic SefA also formed stable multimers at low concentrations of chemical cross-linker but multimerization of the truncated form required high concentrations of protein or cross-linker. Thus, SefA fimbrins appear to multimerize through their N-termini and undergo a conformational change prior to assembly into fibers. Within these fibers, subunit-subunit contact is maintained through strong hydrophobic interactions.



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L4: Entry 12 of 60

File: PGPB

Oct 3, 2002

DOCUMENT-IDENTIFIER: US 20020142008 A1

TITLE: Immunogenic pili presenting foreign peptides, their production and use

Detail Description Paragraph:

[0036] Oligonucleotide primers corresponding to the cleavage sites in proper orientation separated by desired sequences to be incorporated into the chimeric papA template are synthesized by conventional techniques. They are used to fill the cleaved recessed termini. A salmonella flagellin epitope corresponding to 6 amino acids and an epitope of human interleukin-4 peptide corresponding to 20 amino acids have been inserted into papA genetic cassettes. These genetic templates in Escherichia coli HB101 strain result in pili being expressed at the surface of the bacterium as demonstrated by electron microscopy and expression of hybrid pili as demonstrated by simultaneous binding of a single protein band in SDS-PAGE gels by Western blotting using polyclonal murine antibody to the pili and foreign epitopes. Cohorts of 5 mice each immunized with the hybrid product can elicit antibodies to the foreign epitope as demonstrated in ELISA tests.

[Previous Doc](#)[Next Doc](#)[Go to Doc#](#)



DOCUMENT-IDENTIFIER: US 6585980 B1  
TITLE: Flagellin gene, FlaC of Campylobacter

Other Reference Publication (3):

Joys, TM et al, Infection and Immunity, vol. 59(6), pp. 3330-3332, Sep. 1991, Epitope mapping of the d  
Flagellar antigen of Salmonella muenchen.\*

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L4: Entry 27 of 60

File: USPT

Oct 2, 2001

DOCUMENT-IDENTIFIER: US 6297048 B1

TITLE: Hepatitis therapeutics

Other Reference Publication (96):

Newton et al., "Immune Response to Cholera Toxin Epitope Inserted in Salmonella Flagellin," Science 244: 70-72, 1989.

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L4: Entry 33 of 60

File: USPT

Jul 18, 2000

DOCUMENT-IDENTIFIER: US 6090586 A  
TITLE: 66 kDa antigen from Borrelia

Brief Summary Text (39):

It is contemplated that the antigens and immunogens of the invention will be useful in providing the basis for one or more assays to detect antibodies against Bb. Previous assays have used whole Bb as the antigen. Sera from normal individuals not exposed to Bb often contain antibodies that react with Bb antigens, in particular antigens that have epitopes in common with other bacteria. It is necessary to adjust assay conditions or the diagnostic threshold of reactivity to avoid false positive reactions due to these cross-reactive antibodies in normal sera. These adjustments may in turn decrease the sensitivity of the assay and lead to false negative reactions, particularly in the early stages of Bb infection. Assays using the disclosed 66 kDa proteins or antigenic polypeptides thereof, are expected to give superior results both in sensitivity and selectivity when compared to assays that use whole Bb or even purified flagella in either an indirect ELISA or an antibody capture ELISA format. Western immunoblots based on reactions with such antigens (whole Bb, flagella and the like) have been difficult to interpret due to the presence of antibodies in sera from unexposed individuals. These antibodies cross react with Bb antigens, most particularly the 41 kDa flagellin and the 60 kDa common antigen protein. Generally, assays which use whole organisms or purified flagella tend to contain antigens with epitopes that will cross react with other bacterial antigens. For example, the N and C terminal regions of the Bb flagellin possess 52-55% sequence identity with the Salmonella typhimurium and Bacillus subtilis sequences (Wallich et al., 1990), exemplifying the highly conserved nature of flagellin structure. The 60 kDa Bb protein is likewise 58 homologous with the E. coli protein (Shanafelt et al., 1991). Such cross reactivity is not likely with the 66 kDa antigen, which is apparently unique to Bb.

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DOCUMENT-IDENTIFIER: US 4916075 A

TITLE: Differential homogeneous immunosensor device

Detailed Description Text (74):

The coated CPF cell is connected to the sample and hold amplifier as previously described. A sample of 100 ul volume, usually a culture broth suspected of containing Salmonella (at a concentration of  $10^{5.5}$  cells/ml or greater) is acidified and re-neutralized to free the flagellar antigen, is added to the cell followed by a 100 ul volume of an anti-salmonella-antibody conjugate to the lactoperoxidase-glucose oxidase complex. The antibody for the complex conjugate may be of the same competitive epitope specificity or specific to a different epitope found on the flagellar antigen. At some interval of time later, the measurement is made by the addition of 100 ul of substrate solution containing 3% glucose in a BSA-PBS-KI buffer pH 7.2. The presence of specific Salmonella is made by a measurable response greater than any non-specific response observed from the reference side of the CPF cell.

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### Search Results - Record(s) 1 through 4 of 4 returned.

#### 1. Document ID: US 5807694 A

L6: Entry 1 of 4

File: USPT

Sep 15, 1998

DOCUMENT-IDENTIFIER: US 5807694 A

TITLE: Detection of salmonella enteritidis and other pathogenic microorganisms and monoclonal antibody useful therefor

#### Brief Summary Text (8):

Infection by *Salmonella enteritidis* threatens the safety of human consumers and the economic soundness of the egg and poultry industry, as well as the food industry in general. The severe outbreak of this organism in 1988 alone in Britain resulted in a permanent 20% loss in volume of the egg market (U.S. Department of Agriculture, *Salmonella enteritidis* Task Force (1990)). Its control and elimination requires early detection in raw shell eggs. Traditional methods for detection of *Salmonella enteritidis* in eggs are scarce and require up to one week in order to culture and identify bacterial isolates. These methods are also labour-intensive, involve isolation of the organism using pre-enrichment as well as selective enrichment procedures and serological confirmation tests (Van der Zee, *Int. J. Food Microbiol.* (1994)21:41). More rapid methodology available for serological detection of *Salmonella enteritidis* is represented by two basic enzymatic-linked immunoassay (ELISA) procedures, the sandwich and indirect ELISA. Both employ antisera as well as monoclonal antibodies produced against flagella, lipopolysaccharides (LPS) and fimbriae SEF14 (Van Zijderveld et al., *J. Clin. Microbiol.* (1992) 30:2560). In contrast to conventional methods, these tests can detect *Salmonella enteritidis* in two days. However, they are not free of drawbacks. The tests involve time-consuming enrichment incubations, exhibit varying degrees of cross-reactions, particularly between serogroup B (*S. typhimurium*) and D lipopolysaccharides and both systems have been known to produce false positive reactions.

Full	Title	Citation	Front	Review	Classification	Date	Reference	Claims	KOMIC	Draw. De
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#### 2. Document ID: US 5510241 A

L6: Entry 2 of 4

File: USPT

Apr 23, 1996

DOCUMENT-IDENTIFIER: US 5510241 A

TITLE: Method of testing for the presence of Salmonella serotypes expressing Salmonella enteritidis fimbrial antigen (SEFA) and reagents therefore

#### Abstract Text (1):

A method of testing for the presence of *Salmonella* serotypes *S. enteritidis* and *S.*

dublin is provided. Novel monoclonal antibodies are used to detect the presence of an epitope specific for these serotypes in cultures which have been grown on selected media which enhance the expression of said epitope in fimbrial sites. Test kits utilizing the antigen or its epitopic parts, antibodies and/or the media are further provided.

Brief Summary Text (4):

It is known that Salmonella organisms have fimbria-like structures on their surface ( Duguid; J. P.; and R. R. Gillies. (1958) J. Pathol. Bacteriol. 75:519-520., and published evidence ( Clegg, S., and G. A. Gerlach (1987) J. Bacteriol. 169:934-938), suggests that there are antigenically distinct types of such fimbriae, ie possessing specific epitopes on the fimbrial antigens. The possibility of immunogenic tests for Salmonella, at least S. enteritidis, based upon these fimbrial antigens has been suggested (MAFF, Central veterinary Laboratory "Animal Health" (1989):33). Methods of raising MABs to antigens on the surface of microorganisms such as Salmonella are generally known.

Brief Summary Text (5):

Unfortunately known methods of raising antibodies to Salmonella surface antigens only go part way toward providing an immunological test for Salmonella. The basis of all such tests is to isolate microorganisms from a sample suspected of harbouring Salmonella organisms, then to grow the micro-organisms in vitro in a suitable culture medium until a quantity of the Salmonella sufficient to detect by such a test is believed to be present in the medium, and then applying the test. A problem occurs in that it is found that although Salmonella micro-organisms produce their fimbrial antigen when they grow in vivo, e.g. in the gut, in animal tissues or fluids, in food products and in some natural environments, many of the fimbrial antigens are not produced when they are grown in vitro on most culture media.

Brief Summary Text (6):

The inventors have investigated a range of culture media with the object of identifying the conditions necessary to induce the Salmonella micro-organisms S. enteritidis and S. dublin to produce a specific fimbrial antigen during in vitro culture so that immunological tests may be applied. This has provided the novel test method of this invention and also novel MABs designated herein as "MAB 69/25" and "MAB 71/3", produced by novel hybridoma cell lines, for use in the method. Samples of these cell lines have been deposited, on 11 Oct. and 19 Dec. 1990 respectively, at the European Collection of Animal cell Cultures, PHLS Centre for Applied Microbiology & Research, Porton Down, Salisbury, Wiltshire-SP4 OJG, United Kingdom and bear Accession numbers 90101101 and 90121902 respectively.

Brief Summary Text (7):

This investigation has provided a method for testing for the presence of micro-organisms of the species Salmonella, serotypes S. enteritidis and S. dublin, using the specific fimbrial antigen or an epitopic part thereof to bind them. Thus suspect biological fluids may be tested for such antibodies with the aim of identifying cases of S. enteritidis or S. dublin infection. The particular specific antigen identified by the present inventors has been found to be expressed almost exclusively by organisms of these two serotypes, the only other serotypes expressing it being considered very rare. A particular advantage of the method is thus that, out of the hundreds of serotypes of Salmonella found in nature, it can detect two of the most significant with regard to food poisoning.

Brief Summary Text (9):

The inventors have found that exploitation of the ability of certain media to enable or cause Salmonella to produce this specific fimbrial antigen (Salmonella enteritidis fimbrial antigen-SEFA) during in vitro culture, whereby prior to the step of exposure to the antibody the micro-organisms are grown in vitro in or on such a medium such that they produce antigenic fimbriae having epitopic sites thereupon, allows reliable immuno-testing.

Brief Summary Text (10):

The influence of the medium appears to be particularly pronounced in the case of the said important Salmonella micro-organisms *S. enteritidis* and *S. dublin*. The method of the invention is therefore particularly suitable for the specific testing for the presence of *S. enteritidis* and *S. dublin* by the use of antibody-antigen binding, as these two Salmonella strains produce strongly antigenic fimbriae under the conditions of this invention, particularly of the preferred embodiment. The method appears to be applicable to testing for Salmonella in all types of samples, including food samples, environmental samples such as contaminated water, animal waste products, effluent etc.

Brief Summary Text (11):

The content of the culture medium is a crucial factor in the production of epitopic sites on the Salmonella fimbria. Media which are "defined" or at least "semi-defined" as understood in the art are preferred, for example media having at least 20% by weight of their nutrient composition made up of "defined" nutrients which are inorganic salts and/or organic compounds of known molecular structure. Peptone water and Enriched E broth (see Francis et al (1982) J. Clinical. Microbiol.. 15: 181-183) are examples of preferred liquid media although Slanetz broth, Heart infusion broth and Vogel Bonner broth are media capable of supporting expression of the specific sites by the target Salmonella organisms in many cases. Solid media examples include desoxycholate citrate agar, McConkey agar, Nutrient agar, Salmonella Shigella agar, Sheep blood agar, Xylose Lysine descholate. For more reliable and/or sensitive testing it may be necessary to use a medium that is more potent in supporting the expression, as is evidenced by the experiments referred to herein; examples of such media being Oxoid Isosensitest and Sensitest agars.

Brief Summary Text (12):

Thus the present invention provides a method of testing for the presence of microorganisms of Salmonella serotypes *S. enteritidis* or *S. dublin* comprising exposing an analyte suspected of containing them or their fimbrial antigen (SEFA as described herein) to an antibody raised to said fimbrial antigen or to an epitopic part thereof, and then relating the occurrence of antibody-antigen specific binding to the presence of said serotypes.

Brief Summary Text (14):

The present invention further provides a method of determining the identity of a Salmonella serotype as being either *S. enteritidis* or *S. dublin* comprising (a) exposing an analyte suspected of comprising at least one of said serotypes or their fimbrial antigen (SEFA as described herein) to an antibody raised to said fimbrial antigen, or a part thereof, and then relating the occurrence of antibody-antigen specific binding to the presence of one of said serotypes then, (b) exposing a further sample of said analyte suspected of comprising at least one of said serotypes to an antibody raised to specifically bind to a first one of said serotypes but not the second and relating the occurrence of antibody-antigen specific binding to the presence of that serotype and, optionally, (c) exposing a further sample of said analyte suspected of comprising at least one of said serotypes to an antibody raised to specifically bind to the second one of said serotypes but not to the first and relating the occurrence of antibody-antigen specific binding to the presence of said second serotype.

Brief Summary Text (15):

The present invention further provides a method of testing for the presence of organisms of Salmonella serotypes *S. enteritidis* or *S. dublin* comprising (a) seeding a sample of an analyte suspected of containing them into/onto a culture medium selected for its ability to support expression of Salmonella enteritidis fimbrial antigen (SEFA); (b) culturing said seeded culture medium and; (c) exposing a sample derived from the culture derived from step (b) to an antibody raised to said fimbrial antigen, or an epitopic part thereof, and then relating the

occurrence of antibody-antigen specific binding to the presence of said serotypes.

Brief Summary Text (25):

Growth of the Salmonella micro-organisms on the medium in the process of the invention may be under entirely standard conditions, e.g. by incubation at about 37.degree. C. until a sufficient number of the micro-organisms having epitopic sites on their fimbriae have grown, for example typically by overnight incubation. An incubation temperature of above 22.degree. C. is preferred for the effective production of the antigenic fimbriae bound by the monoclonal antibodies of the present invention. In applying the test in practice, a sample from a suspected material would be taken, containing a cross-section of all the micro-organisms present in the material, and these would then be grown on the medium so that Salmorella, if present, grows among any other micro-organisms that might be present. The presence of other micro-organisms does not seem to adversely affect the test. The test is further of use in the identification of the serotype of pure cultures of Salmonella organisms; ie: as S. enteritidis, S. dublin or other, further antibodies being usable to distinguish them further.

Brief Summary Text (26):

Procedures for raising both polyclonal and monoclonal antibodies to Salmonella surface antigens are well known. Thus, for example, S. enteritidis may be grown on a medium as described above so that antigenic fimbriae are produced, these then may be used to immunise mice from which spleen cells are subsequently isolated and fused with a myeloma cell line to form hybridomas. These hybridomas may then be seeded into microwells and monitored for antibody production, e.g. by ELISA or a similar technique. Antibody-producing hybridomas may then be cloned to produce a mouse monoclonal antibody to the Salmonella fimbrial antigen. MABs may be produced by the known method of intraperitoneally injecting hybridoma cells (e.g.; 10.sup.6) into mice and withdrawing ascites after 20 days; this can be used in crude form if necessary.

Brief Summary Text (27):

A particularly preferred monoclonal antibody is one having a specific immuno-affinity for the specific S. enteritidis fimbrial antigen (SEFA) produced by growth on one of the aforementioned media, ie. an antigenic protein fraction having a molecular weight of around 14,300 identified in the fimbrial structure after such growth conditions and having a major antigenic activity, or for immunoreactive (e.g. epitopic) parts or analogues thereof. The method and kits may employ polyclonal antibodies.

Brief Summary Text (28):

Examples of such monoclonal antibodies are those identified as MAB 69/25 and MAB 71/3 above and their use further extends to (i) the determination of media suitable for growing salmonella possessing the required antigenic fimbriae and (ii) for identification of said antigenic fimbriae and antigens comprising the SEFA epitope itself. Thus further specific media suitable for the performance of the method of the invention may be easily identified by screening salmonella grown in them for the ability to produce immunoagglutination with said MABs; a positive result indicating a suitable medium.

Brief Summary Text (29):

Either the whole Salmonella micro-organisms (live or dead) or a part thereof which includes the fimbrial antigen with the SEFA epitopic site may be detected by the antibody. In the latter case methods are well known, e.g. mild heat shock treatment at 60.degree. C. for 30 minutes, for detaching fimbriae from Salmonella micro-organisms, and isolation of the fimbrial antigen in this way should lead to a more specific test result. The epitopic sites employed in the testing method of the preferred embodiment of the invention appear to be present on a fimbrial structure produced on the surface of S. enteritidis and S. dublin grown on media of the present invention and in vivo, which is less than 6 nm in diameter and consists of

identical repeating subunits each of molecular weight between 14,000 and 15,000. These fimbriae have a 'kinked' conformation such that they entangle and extend in a matted form to approximately 200 nm from the cell surface. By applying size exclusion HPLC and SDS-PAGE to the fimbrial antigen isolated in such a way it has been determined that the principal antigenic protein employed appears to have a molecular weight of approximately 14,300. The sequence of isolated SEFA is given on page 20.

Brief Summary Text (30):

Exposure of the antigen to the antibody and the observation of the occurrence or otherwise of antibody-antigen binding may be carried out in ways which will be apparent to those skilled in the art of immunoassay. For example the whole micro-organisms may be exposed to a solution of the antibody for a suitable time, then after washing the micro-organisms may be exposed to a colloidal gold labelled second antibody. If the antibody is a mouse monoclonal this second antibody may, for example, be an anti-mouse Ig G. The binding of the antibody to the fimbriae may then be detected using microscopy to observe the clustering of gold particles around the fimbriae or said gold may have its visibility enhanced in known ways. Other suitable labels will occur to a man skilled in the art.

Brief Summary Text (31):

In another way immunoagglutination may be observed by simply adding a solution of the antibody to a solution or suspension of the microorganisms or to a culture thereof or to parts thereof such as the isolated fimbriae or the antigenic protein employed by the preferred embodiment of the invention. To assist in visualising immunoagglutination the antibody may be, labelled for example with coloured latex particles as is known in the art (Hechemy K E and Michaelson (1984) Lab Management 22 27-40).

Brief Summary Text (32):

In a further way, the antigen in the form of whole micro-organisms, the isolated fimbriae or isolated SEFA may be immobilised on a substrate such as a microtitre plate well, using known methods, then this immobilised antigen may be exposed to a solution of the antibody, then after washing a second labelled antibody capable of binding to the SEFA epitope unlabelled antibody may be applied (e.g.: a labelled anti-mouse Ig G) to the wells. After further washing detection of binding between this second antibody and the antibody itself bound to the immobilised antigen may then be observed by the presence of the bound label on the well. Other antibody/second antibody combinations will occur to the man skilled in the art (e.g. bovine or chicken antibodies/anti-bovine or anti-chicken second antibodies). Kits comprising free or immobilised SEFA or fimbriae are thus provided.

Brief Summary Text (33):

In a yet further way the antibody may be immobilised on a substrate and the immobilised antibody may then be exposed to a solution containing the antigen in the form of for example whole micro-organisms, the isolated fimbriae or the antigenic protein (SEFA), together with an agent capable of competing with the antigen for binding sites on the antibody. The quantity of the agent binding to the immobilised antibody may then be determined, e.g.: by use of known, labelling techniques. For example the competing agent may be a labelled anti-mouse IgG if the antibody is a mouse monoclonal, or may be labelled fimbrial antigen.

Detailed Description Text (21):

Transmission electron microscopy of *S. enteritidis* 1246/89 (fusion strain) cultured for 18 hours at 37.degree. C. revealed three identifiable types of surface organelles. The majority of organisms expressed flagellae, as well as a 'rigid', straight type 1 fimbriae measuring up to 300 nm in length and 8 nm in diameter, projecting from the cell surface. The number of fimbriae on each bacterial cell was variable, and some organisms were devoid of any. A fine fibrillar material attached, usually uniformly, around the bacterium was also observed. Individual

filaments within this material were difficult to visualise, measuring less than 5 nm in diameter. Filaments had a 'kinked' conformation such that they entangled with each other to form a matted appearance. The matted fibrils extended from the cell surface to approximately 200 nm within the limit of the pool of negative stain around each cell. When the same strain of *S. enteritidis* was incubated with MAB 69/25 and immunogold conjugate, the fimbrial material was labelled heavily with gold particles. Once labelled this antigen could be seen to extend up to 0.1 micrometers from the cell surface, and was also found in detached amorphous clumps.

Detailed Description Text (22):

Flagellae and type 1 fimbriae were unlabelled. Two further *S. enteritidis* strains and three *S. dublin* strains that reacted in the direct binding ELISA, also expressed this fimbrial material which was specifically labelled with the MAB, although many *S. dublin* organisms appeared within a population not to express this structure or epitope. Fimbrial antigen was not detected or labelled when the same strains of *S. enteritidis* and *S. dublin* were grown at 22.degree. C. Strains of *S. gallinarum*, *S. pullorum* and *S. typhimurium* grown at 37.degree. C. for 24 hr were not labelled with gold after probing with Mab.

Detailed Description Text (24):

The above experiments illustrate the identification of a specific antigen located on the fimbriae of strains of *S. enteritidis* grown on Slanetz broth, a semi-defined medium, at 37.degree. C., and the raising of a specific monoclonal antibody MAB 69/25 to this antigen. Tests show that MAB 69/25 binds only to certain *Salmonella* serotypes within serogroup D. These results were extended and confirmed when a further 264 *Salmonella* strains from 63 serotypes were examined. All the strains of *S. enteritidis* tested, regardless of phage type, reacted with this MAB. *S. dublin* (12/36 strains) and the one strain of *S. moscow* tested were the only other serotypes that were positive.

Detailed Description Text (25):

Electron microscope studies confirmed that MAB 69/25 is directed against an epitope on a fimbrial structure expressed on the bacterial surface that is morphologically distinct from flagellae and the larger type 1 fimbriae. This structure was observed only on *Salmonella* strains that reacted in direct binding ELISAs and these strains were labelled when examined by immune EM.

Detailed Description Text (26):

This fimbrial structure is much smaller than the type 1 fimbriae commonly found on *Salmonella* strains (Clegg et al above), and unlike type 3 fimbriae carried by *Salmonellae*, it lacks any haemagglutinating activity (Clegg et al above; Abegbola, R. A., D. C Old and S. Aleksic 1983. FEMS Microbiol. Lett. 19: 233-238; Old. D. C., and R. A. Adegbola, 1985. J. Med. Microbiol. 20: 113-121). This fimbrial structure, which carries an epitope restricted to all strains of *S. enteritidis* and certain strains of *S. dublin* and *S. moscow* (see Tables I and II) differs from all previously described *Salmonellae* structures.

Detailed Description Text (29):

AMINO ACID SEQUENCE OF *SALMONELLA* ENTERIDITIS FIMBRIAL ANTIGEN (SEFA).

Detailed Description Text (32):

Assessment of various media for the ability to support expression of *Salmonella* enteritidis fimbrial antigen (SEFA).

Detailed Description Text (69):

To prepare a batch of latex coated with rabbit polyclonal serum against flagella of *S. dublin*.

Detailed Description Text (112):

Fimbrial antigens were prepared from *S. enteritidis* 468/86 which has been identified as expressing large quantities of the fimbriae.

Detailed Description Text (113):

The organisms were grown on Sensitest agar (Oxoid, Basingstoke, United Kingdom) overnight at 37.degree. C. Bacteria were sedimented and suspended in phosphate buffered saline (PBS) pH 6.8. The fimbriae were then removed from the surface of the bacteria by heating the suspension at 60.degree. C. for 30 min. The cell-free supernatant (crude SEFA) was first purified by DEAE-sepharose anion exchange chromatography (semi-pure SEFA) followed by size exclusion high-pressure liquid chromatography (pure SEFA). The purity of the SEFA preparations was determined by sodium dodecyl-sulphate-polyacrylamide gel-electrophoresis (SDS-PAGE) using 12.5% gels.

Detailed Description Text (140):

Specific immuno-gold labelling of SEFA occurred with all the MABs (Table VII) and RaSEFA. No difference in intensity or distribution of gold particles labelling SEFA was apparent when MABs from different epitope cluster groups were tested; the gold was distributed evenly throughout SEFA in all cases and was similar to the labelling of the fimbrial antigen with RaSEFA.

Detailed Description Text (145):

FIGS. 1A and 1B are *S. enteritidis* negatively stained with PTA showing three distinct surface organelles. 1A; fine fimbrial material radiating from cell surface and a detached flagellum (arrow). Bar, 200 nm. 1B; fimbrial material (fa) forming matted appearance, and type 1 fimbriae (arrows). Bar 200 nm.

Detailed Description Text (146):

FIGS. 2A and 2B are *S. enteritidis* organisms probed with Mab 69/25 and labelled with immunogold. 1A; specific labelling of matted fimbrial antigen (fa) uniformly covering the cell surface. Bar, 600 nm. 2B; gold particles attached to matted fimbrial antigen (fa), but flagella and type 1 fimbriae (arrows) are unlabelled. Bar, 400 nm.

Detailed Description Text (147):

FIG. 3 is two *S. dublin* organisms from culture probed with Mab 69/25 and labelled with immunogold. Cell 'a' is heavily labelled with gold particles. Cell 'b' does not exhibit surface fimbrial material and is unlabelled. Flagella fragments are unlabelled. Bar, 600 nm.

Detailed Description Paragraph Table (6):

TABLE IV

Effect of growth medium on the production of SEFA fimbrial antigen by Salmonella enteritidis strains using latex agglutination. sup.a S. enteritidis strains Growth medium A B C D E F

[illegible]

+, agglutinates 3-4 min; ++, agglutinates 1-3 min; +++, agglutinates .ltoreq. 1 min. -, negative.

## Detailed Description Paragraph Table (7):

TABLE V

TABLE V Detection of SEFA fimbrial antigen on Salmonella strains by the latex agglutination test. Latex agglutination No. of

strains test Serotype examined + - \_\_\_\_\_ S.  
 enteritidis 64 64 -- S. dublin 33 28 5 S. blegdam 1 1 -- S. moscow 1 1 -- Other  
 Salmonella strains.sup.a 181 -- 181 \_\_\_\_\_ .sup.a  
 Serotypes listed in Table IV.

Other Reference Publication (4):

Feutrier et al, "Purification and Characteristics of Fimbriae from Salmonella enteritidis", J. Bacteriol., 168(1): 221-227 (Oct. 1986).

Other Reference Publication (6):

Thorns et al, "Detection of a Novel Fimbrial Structure on the Surface of Salmonella enteritidis by Using a Monoclonal Antibody", J. Clin. Microbiol., 28(11): 2409-2414 (Nov. 1990).

CLAIMS:

1. A method of testing a sample for the presence of microorganisms for Salmonella serotypes expressing Salmonella enteritidis fimbrial antigen (SEFA) comprising the steps of:

(a) exposing a sample suspected of containing the microorganisms, or SEFA to an antibody which specifically binds to the antigen specifically bound by the monoclonal antibody secreted by ECACC 90101101 or ECACC 90121902 or an antibody which specifically binds the epitope bound by the monoclonal antibody secreted by ECACC 90101101 or ECACC 90121902;

(b) detecting antibody-antigen specific binding, wherein antigen-antibody specific binding is indicative of the presence of microorganisms selected from the group consisting of S. enteritidis, S. dublin, S. moscow and S. blegdam, and the absence of antibody-antigen specific binding is indicative of the absence of S. enteritidis.

5. A method of testing a sample for the presence of organisms of the group of Salmonella serotypes expressing SEFA comprising the steps of:

(a) seeding said sample suspected of containing the organisms into or onto a culture medium supporting the expression of Salmonella enteritidis fimbrial antigen;

(b) culturing said sample in or on the culture medium; and

(c) exposing a second sample obtained from the culturing step (b) to an antibody which specifically binds to the antigen specifically bound by the monoclonal antibody secreted by ECACC 90101101 or ECACC 90121902 or an antibody which specifically binds the epitope bound by the monoclonal antibody secreted by ECACC 90101101 or ECACC 90121902 and then detecting antibody-antigen specific binding wherein antibody-antigen specific binding is indicative of the presence of organisms of the group of Salmonella serotypes expressing SEFA.

27. A test kit as claimed in claim 25 or claim 26 wherein the SEFA is in the form of detached fimbriae.

Full	Title	Citation	Front	Review	Classification	Date	Reference			Claims	KNOC	Draw De
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☐ 3. Document ID: AU 2002359984 A1, WO 2004055045 A1

L6: Entry 3 of 4

File: DWPI

Jul 9, 2004

DERWENT-ACC-NO: 2004-517400

DERWENT-WEEK: 200474

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TITLE: Salmonella antigen formulation useful for identifying SE-infected fowl and fowl inoculated with SE-attenuated vaccine, comprising Salmonella enteritidis flagellin 9 kDa polypeptide

INVENTOR: EKAWA, T; OHTA, H ; TOYATA, Y ; YAMAMOTO, S

PRIORITY-DATA: 2002WO-JP13148 (December 16, 2002)

## PATENT-FAMILY:

PUB-NO	PUB-DATE	LANGUAGE	PAGES	MAIN-IPC
<u>AU 2002359984 A1</u>	July 9, 2004		000	C07K014/255
<u>WO 2004055045 A1</u>	July 1, 2004	J	036	C07K014/255

INT-CL (IPC): A61 K 39/00; A61 K 39/112; A61 P 31/04; C07 K 14/255; G01 N 33/53;  
G01 N 33/569

Full	Title	Citation	Front	Review	Classification	Date	Reference			Claims	KWIC	Draw D
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☐ 4. Document ID: CN 1361828 A, WO 200078995 A1, AU 9948172 A

L6: Entry 4 of 4

File: DWPI

Jul 31, 2002

DERWENT-ACC-NO: 2001-071400

DERWENT-WEEK: 200279

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TITLE: New method for the specific detection of Salmonella enteritidis infections of poultry comprises contacting a biological sample with antigenic fragments of S. enteritidis fimbrial and/or flagellin proteins

INVENTOR: KWANG, H; LIU, W ; LOH, K Y H ; LOW, S S

PRIORITY-DATA: 1999WO-SG00061 (June 22, 1999)

## PATENT-FAMILY:

PUB-NO	PUB-DATE	LANGUAGE	PAGES	MAIN-IPC
<u>CN 1361828 A</u>	July 31, 2002		000	C12Q001/10
<u>WO 200078995 A1</u>	December 28, 2000	E	047	C12Q001/10
<u>AU 9948172 A</u>	January 9, 2001		000	C12Q001/10

INT-CL (IPC): C07 K 14/255; C12 Q 1/10

Full	Title	Citation	Front	Review	Classification	Date	Reference			Claims	KWIC	Draw D
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File 94:JICST-EPlus 1985-2005/May W3  
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File 98:General Sci Abs/Full-Text 1984-2004/Dec  
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File 65:Inside Conferences 1993-2005/Jul W1  
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Set Items Description

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S2 193 RD (unique items)

S3 91 S2/1999:2005

S4 102 S2 NOT S3

S5 193 S2/PATENTS

S6 102 S2 NOT S3

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NCBI BLAST program reference [PMID:9254694]:

Altschul S.F., Madden T.L., Schäffer A.A., Zhang J., Zhang Z., Miller W., Lipman D.J. Gapped BLAST and PSI-BLAST: a new generation of protein database search programs. Nucleic Acids Res. 25:3389-3402(1997).

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Query: 90 AA (of which 18% low-complexity regions filtered out)

Date run: 2005-07-06 11:31:24 UTC+0100 on sib-gml.unil.ch

Program: NCBI BLASTP 1.5.4-Paracel [2003-06-05]

Database: EXPASY/UniProtKB

2,035,690 sequences; 659,769,346 total letters

UniProt Knowledgebase Release 5.4 consists of:

UniProtKB/Swiss-Prot Release 47.4 of 05-Jul-2005: 186882 entries

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<input type="checkbox"/>	tr	<u>Q54414</u>	_SALET Phase-1 flagellin (Fragment) [fliC] [Salmonella ...]	<u>131</u>	4e-30
<input type="checkbox"/>	sp	<u>Q06983</u>	FLIC_SALSE Flagellin (Phase-1-C flagellin) [fliC] [Sal...	<u>130</u>	6e-30
<input type="checkbox"/>	sp	<u>Q06969</u>	FLIC_SALBU Flagellin (Phase-1-C flagellin) [fliC] [Sal...	<u>130</u>	6e-30
<input type="checkbox"/>	tr	<u>Q66PR0</u>	_SALBU Phase 1 flagellin [fliC] [Salmonella budapest]	<u>130</u>	6e-30
<input type="checkbox"/>	tr	<u>Q6V2X0</u>	_9ENTR Phase 1 flagellin [fliC] [Salmonella enterica]	<u>130</u>	6e-30
<input type="checkbox"/>	tr	<u>Q6V2U7</u>	_9ENTR Phase 1 flagellin [fliC] [Salmonella enterica]	<u>130</u>	6e-30
<input type="checkbox"/>	tr	<u>Q6V2U6</u>	_9ENTR Phase 1 flagellin [fliC] [Salmonella enterica]	<u>130</u>	6e-30
<input type="checkbox"/>	tr	<u>Q6LD27</u>	_SALET Phase-1 flagellin (Fragment) [fliC] [Salmonella ...]	<u>130</u>	6e-30
<input type="checkbox"/>	tr	<u>Q53995</u>	_9ENTR Phase 1 flagellin [fliC] [Salmonella enterica]	<u>129</u>	1e-29
<input type="checkbox"/>	tr	<u>Q6V2V7</u>	_9ENTR Phase 1 flagellin [fliC] [Salmonella enterica]	<u>127</u>	7e-29
<input type="checkbox"/>	tr	<u>Q53994</u>	_9ENTR Phase 1 flagellin [fliC] [Salmonella enterica]	<u>125</u>	2e-28
<input type="checkbox"/>	tr	<u>Q6V2T7</u>	_9ENTR Phase 1 flagellin [fliC] [Salmonella enterica]	<u>124</u>	4e-28
<input type="checkbox"/>	tr	<u>Q6V2G8</u>	_9ENTR Phase 1 flagellin [fliC] [Salmonella enterica]	<u>124</u>	6e-28
<input type="checkbox"/>	sp	<u>Q06974</u>	FLIC_SALON Flagellin (Phase-1-C flagellin) [fliC] [Sal...	<u>123</u>	8e-28
<input type="checkbox"/>	tr	<u>Q6V2U1</u>	_9ENTR Phase 1 flagellin [fliC] [Salmonella enterica]	<u>123</u>	8e-28
<input type="checkbox"/>	tr	<u>Q6LD24</u>	_SALET Phase 1 flagellin [fliC] [Salmonella enterica su...	<u>123</u>	8e-28
<input type="checkbox"/>	tr	<u>Q54415</u>	_SALET Phase-1 flagellin (Fragment) [fliC] [Salmonella ...]	<u>123</u>	8e-28
<input type="checkbox"/>	tr	<u>Q53821</u>	_SALET Phase-1 flagellin (Fragment) [fliC] [Salmonella ...]	<u>123</u>	8e-28
<input type="checkbox"/>	tr	<u>Q6V2G7</u>	_9ENTR Phase 1 flagellin [fliC] [Salmonella enterica]	<u>122</u>	2e-27
<input type="checkbox"/>	tr	<u>Q6V2U4</u>	_9ENTR Phase 1 flagellin [fliC] [Salmonella enterica]	<u>122</u>	2e-27
<input type="checkbox"/>	tr	<u>Q6V2U3</u>	_9ENTR Phase 1 flagellin [fliC] [Salmonella enterica]	<u>121</u>	3e-27
<input type="checkbox"/>	tr	<u>Q54515</u>	_SALET Phase 1 flagellin [fliC] [Salmonella enterica su...	<u>118</u>	3e-26
<input type="checkbox"/>	tr	<u>Q9R2V0</u>	_SALPU Phase 1 flagellin C (Fragment) [fliC] [Salmonell...	<u>99</u>	2e-20
<input type="checkbox"/>	tr	<u>Q5G1R0</u>	_SALGL FliC (Fragment) [fliC] [Salmonella gallinarum]	<u>91</u>	7e-18
<input type="checkbox"/>	tr	<u>Q9R405</u>	_SALGL Phase 1 flagellin C (Fragment) [fliC] [Salmonell...	<u>88</u>	4e-17
<input type="checkbox"/>	tr	<u>Q9R406</u>	_SALPU Phase 1 flagellin C (Fragment) [fliC] [Salmonell...	<u>87</u>	1e-16
<input type="checkbox"/>	tr	<u>Q5G1Q9</u>	_SALPU FliC (Fragment) [fliC] [Salmonella pullorum]	<u>82</u>	2e-15
<input type="checkbox"/>	tr	<u>Q5G1Q8</u>	_SALGL FliC (Fragment) [fliC] [Salmonella gallinarum]	<u>75</u>	3e-13
<input type="checkbox"/>	tr	<u>Q5ECK7</u>	_ECOLI FliC (Fragment) [fliC] [Escherichia coli]	<u>43</u>	0.002
<input type="checkbox"/>	tr	<u>Q52R20</u>	_ECOLI FliC (Fragment) [fliC] [Escherichia coli]	<u>43</u>	0.002
<input type="checkbox"/>	tr	<u>Q842D4</u>	_ECOLI FliC (Fragment) [Escherichia coli]	<u>43</u>	0.002
<input type="checkbox"/>	tr	<u>Q5ECJ1</u>	_ECOLI FliC (Fragment) [fliC] [Escherichia coli]	<u>43</u>	0.002
<input type="checkbox"/>	tr	<u>Q5ECI9</u>	_ECOLI FliC (Fragment) [fliC] [Escherichia coli]	<u>43</u>	0.002
<input type="checkbox"/>	tr	<u>Q9R3Q8</u>	_ECOLI Flagellin (Fragment) [fliC] [Escherichia coli]	<u>43</u>	0.002
<input type="checkbox"/>	tr	<u>Q8GGI1</u>	_ECOLI Flagellin (Fragment) [fliC] [Escherichia coli]	<u>43</u>	0.002
<input type="checkbox"/>	tr	<u>Q6VMV6</u>	_ECOLI Flagellin [fliC] [Escherichia coli]	<u>43</u>	0.002
<input type="checkbox"/>	tr	<u>Q6VMU9</u>	_ECOLI Flagellin [fliC] [Escherichia coli]	<u>43</u>	0.002
<input type="checkbox"/>	tr	<u>Q5ZPZ4</u>	_ECOLI Flagellin C (Fragment) [fliC] [Escherichia coli]	<u>43</u>	0.002
<input type="checkbox"/>	tr	<u>Q8GGH8</u>	_ECOLI Flagellin (Fragment) [fliC] [Escherichia coli]	<u>41</u>	0.005
<input type="checkbox"/>	tr	<u>Q76DK5</u>	_SALET Phase II flagellin [fljB] [Salmonella enterica s...	<u>41</u>	0.005
<input type="checkbox"/>	tr	<u>Q6V2M6</u>	_9ENTR Phase 1 flagellin [fliC] [Salmonella enterica]	<u>40</u>	0.015
<input type="checkbox"/>	tr	<u>Q6V2M5</u>	_9ENTR Phase 1 flagellin [fliC] [Salmonella enterica]	<u>40</u>	0.015

☐ tr Q8GGI2 \_ECOLI Flagellin (Fragment) [fliC] [Escherichia coli] 39 0.019

**Graphical overview of the alignments**

[Click here](#) to resubmit your query after masking regions matching PROSITE profiles  
or Pfam HMMs  
([Help](#)) (use ScanProsite for more details about PROSITE matches)

**Profile hits**   
**Pfam hits** 

Submission	Matches on query sequence		Mat
	1	50	
FLIC_SALMO			
FLIC_SALEN			
Q53M29			
Q6V2M5			
Q6V2V9			
Q66PR7			
Q6LDG7			
Q6LDG6			
Q66PR6			
Q66PN4			
Q66PN3			
Q54210			
Q53998			
Q54864			
Q54863			
Q54329			
Q53989			
Q53970			
Q53967			
Q53822			
Q79DB7			
Q6V2M1			
Q57381			
Q6V2U9			
Q53993			
FLIC_SALNA			
FLIC_SALDU			
Q6V2V3			
Q66PR3			
Q6V2V2			
Q66PR5			
FLIC_SALMC			
Q66PR2			
Q6V2V0			
FLIC_SALRO			
Q66PR4			
Q6V2V1			
Q6V2V5			
FLIC_SALBE			
Q6V2H1			
Q53583			
FLIC_SALDE			
Q53991			
Q6V2X1			
Q66PR8			
Q6V2M8			
Q66PS0			
Q66PQ9			
Q66PQ8			
Q53996			
Q6V2G9			
Q66PR9			
Q53990			
Q53992			
Q54489			
Q6V2U0			
Q66PR1			
Q54414			
FLIC_SALSE			
FLIC_SALBU			
Q66PR0			
Q6V2X0			
Q6V2U7			
Q6V2U6			
Q6LD27			
Q53995			
Q6V2V7			
Q53994			
Q6V2T7			
Q6V2G8			
FLIC_SALON			
Q6V2U1			
Q6LD24			
Q54415			
Q53821			
Q6V2G7			
Q6V2U4			
Q6V2U3			
Q54515			
Q9R2V0			
Q5G1R0			
Q9R405			
Q9R406			
Q5G1Q9			
Q5G1Q8			
Q5ECK7			

sp	<u>Q06973</u>	Flagellin (Phase-1-C flagellin) [fliC] [Salmonella	504
	FLIC_SALMO	montevideo]	AA
			<u>align</u>
Score = 147 bits (372), Expect = 4e-35			
Identities = 73/73 (100%), Positives = 73/73 (100%)			
Query:	18	DTFDYKGVFTFTIDTKTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQSSKNVYT	77
		DTFDYKGVFTFTIDTKTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQSSKNVYT	
Sbjct:	273	DTFDYKGVFTFTIDTKTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQSSKNVYT	332
Query:	78	SVVNGQFTFDDKT	90
		SVVNGQFTFDDKT	
Sbjct:	333	SVVNGQFTFDDKT	345
sp	<u>Q06972</u>	Flagellin (Phase-1-C flagellin) [fliC] [Salmonella	504
	FLIC_SALEN	enteritidis]	AA
			<u>align</u>
Score = 147 bits (372), Expect = 4e-35			
Identities = 73/73 (100%), Positives = 73/73 (100%)			
Query:	18	DTFDYKGVFTFTIDTKTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQSSKNVYT	77
		DTFDYKGVFTFTIDTKTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQSSKNVYT	
Sbjct:	273	DTFDYKGVFTFTIDTKTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQSSKNVYT	332
Query:	78	SVVNGQFTFDDKT	90
		SVVNGQFTFDDKT	
Sbjct:	333	SVVNGQFTFDDKT	345
tr	<u>Q53WZ9</u>	Phase 1 flagellin [fliC] [Salmonella	505 AA
	Q53WZ9_SALEN	enteritidis]	<u>align</u>
Score = 147 bits (372), Expect = 4e-35			
Identities = 73/73 (100%), Positives = 73/73 (100%)			
Query:	18	DTFDYKGVFTFTIDTKTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQSSKNVYT	77
		DTFDYKGVFTFTIDTKTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQSSKNVYT	
Sbjct:	274	DTFDYKGVFTFTIDTKTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQSSKNVYT	333
Query:	78	SVVNGQFTFDDKT	90
		SVVNGQFTFDDKT	
Sbjct:	334	SVVNGQFTFDDKT	346
tr	<u>Q6V2W5</u>	Phase 1 flagellin [fliC] [Salmonella	505 AA
	Q6V2W5_9ENTR	enterica]	<u>align</u>

Score = 147 bits (372), Expect = 4e-35  
Identities = 73/73 (100%), Positives = 73/73 (100%)

Query: 18 DTFDYKGVTFITIDTKTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQSSKNVYT 77  
DTFDYKGVTFITIDTKTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQSSKNVYT  
Sbjct: 274 DTFDYKGVTFITIDTKTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQSSKNVYT 333

Query: 78 SVVNGQFTFDDKT 90  
SVVNGQFTFDDKT  
Sbjct: 334 SVVNGQFTFDDKT 346

tr Q6V2V9 Phase 1 flagellin [fliC] [Salmonella] 505 AA  
Q6V2V9\_9ENTR enterica] align

Score = 147 bits (372), Expect = 4e-35  
Identities = 73/73 (100%), Positives = 73/73 (100%)

Query: 18 DTFDYKGVTFITIDTKTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQSSKNVYT 77  
DTFDYKGVTFITIDTKTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQSSKNVYT  
Sbjct: 274 DTFDYKGVTFITIDTKTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQSSKNVYT 333

Query: 78 SVVNGQFTFDDKT 90  
SVVNGQFTFDDKT  
Sbjct: 334 SVVNGQFTFDDKT 346

tr Q66PR7 Phase 1 flagellin [fliC] [Salmonella] 505 AA  
Q66PR7\_SALMO monteideo] align

Score = 147 bits (372), Expect = 4e-35  
Identities = 73/73 (100%), Positives = 73/73 (100%)

Query: 18 DTFDYKGVTFITIDTKTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQSSKNVYT 77  
DTFDYKGVTFITIDTKTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQSSKNVYT  
Sbjct: 274 DTFDYKGVTFITIDTKTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQSSKNVYT 333

Query: 78 SVVNGQFTFDDKT 90  
SVVNGQFTFDDKT  
Sbjct: 334 SVVNGQFTFDDKT 346

tr Q6LDG7 Phase-1 flagellin [fliC1] [Salmonella] 505 AA  
Q6LDG7\_SALGL gallinarum] align

Score = 147 bits (372), Expect = 4e-35  
Identities = 73/73 (100%), Positives = 73/73 (100%)

Query: 18 DTFDYKGVTFITIDTKTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQSSKNVYT 77  
DTFDYKGVTFITIDTKTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQSSKNVYT  
Sbjct: 274 DTFDYKGVTFITIDTKTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQSSKNVYT 333

Query: 78 SVVNGQFTFDDKT 90

SVVNGQFTFDDKT  
Sbjct: 334 SVVNGQFTFDDKT 346

tr Q6LDG6 Phase-1 flagellin [fliC1] [Salmonella enterica subsp. 505  
Q6LDG6\_SALET enterica AA  
serovar Gallinarum/pullorum] align

Score = 147 bits (372), Expect = 4e-35  
Identities = 73/73 (100%), Positives = 73/73 (100%)

Query: 18 DTFDYKGVTFITIDTKTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQSSKNVYT 77  
DTFDYKGVTFITIDTKTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQSSKNVYT  
Sbjct: 274 DTFDYKGVTFITIDTKTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQSSKNVYT 333

Query: 78 SVVNGQFTFDDKT 90  
SVVNGQFTFDDKT  
Sbjct: 334 SVVNGQFTFDDKT 346

tr Q66PR6 Phase 1 flagellin [fliC] [Salmonella enterica subsp. 505  
Q66PR6\_SALET enterica AA  
serovar Enteritidis] align

Score = 147 bits (372), Expect = 4e-35  
Identities = 73/73 (100%), Positives = 73/73 (100%)

Query: 18 DTFDYKGVTFITIDTKTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQSSKNVYT 77  
DTFDYKGVTFITIDTKTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQSSKNVYT  
Sbjct: 274 DTFDYKGVTFITIDTKTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQSSKNVYT 333

Query: 78 SVVNGQFTFDDKT 90  
SVVNGQFTFDDKT  
Sbjct: 334 SVVNGQFTFDDKT 346

tr Q66PN4 Phase 1 flagellin [fliC] [Salmonella enterica subsp. 505  
Q66PN4\_SALET enterica AA  
serovar Emek] align

Score = 147 bits (372), Expect = 4e-35  
Identities = 73/73 (100%), Positives = 73/73 (100%)

Query: 18 DTFDYKGVTFITIDTKTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQSSKNVYT 77  
DTFDYKGVTFITIDTKTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQSSKNVYT  
Sbjct: 274 DTFDYKGVTFITIDTKTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQSSKNVYT 333

Query: 78 SVVNGQFTFDDKT 90  
SVVNGQFTFDDKT  
Sbjct: 334 SVVNGQFTFDDKT 346

tr Q66PN3 Phase 1 flagellin [fliC] [Salmonella enterica subsp. 505  
Q66PN3\_SALET enterica AA  
serovar Enteritidis] align

Score = 147 bits (372), Expect = 4e-35  
Identities = 73/73 (100%), Positives = 73/73 (100%)

Query: 18 DTFDYKGVTFITIDTKTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQSSKNVYT 77  
DTFDYKGVTFITIDTKTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQSSKNVYT  
Sbjct: 274 DTFDYKGVTFITIDTKTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQSSKNVYT 333  
  
Query: 78 SVVNGQFTFDDKT 90  
SVVNGQFTFDDKT  
Sbjct: 334 SVVNGQFTFDDKT 346

tr Q54210 Phase-1 flagellin [fliC1] [Salmonella 494 AA  
Q54210\_SALGL gallinarum] align

Score = 147 bits (372), Expect = 4e-35  
Identities = 73/73 (100%), Positives = 73/73 (100%)

Query: 18 DTFDYKGVTFITIDTKTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQSSKNVYT 77  
DTFDYKGVTFITIDTKTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQSSKNVYT  
Sbjct: 274 DTFDYKGVTFITIDTKTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQSSKNVYT 333  
  
Query: 78 SVVNGQFTFDDKT 90  
SVVNGQFTFDDKT  
Sbjct: 334 SVVNGQFTFDDKT 346

tr Q53998 Phase-1 flagellin (Fragment) [fliC] [Salmonella 493  
Q53998\_SALEN enteritidis] AA  
align

Score = 147 bits (372), Expect = 4e-35  
Identities = 73/73 (100%), Positives = 73/73 (100%)

Query: 18 DTFDYKGVTFITIDTKTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQSSKNVYT 77  
DTFDYKGVTFITIDTKTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQSSKNVYT  
Sbjct: 262 DTFDYKGVTFITIDTKTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQSSKNVYT 321  
  
Query: 78 SVVNGQFTFDDKT 90  
SVVNGQFTFDDKT  
Sbjct: 322 SVVNGQFTFDDKT 334

tr Q54864 Phase-1 flagellin [fliC] [Salmonella 505 AA  
Q54864\_SALPU pullorum] align

Score = 146 bits (368), Expect = 1e-34  
Identities = 72/73 (98%), Positives = 73/73 (99%)

Query: 18 DTFDYKGVFTFTIDTKTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQSSKNVYT 77  
DTFDYKGVFTFTIDTKTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQSSKNVYT  
Sbjct: 274 DTFDYKGVFTFTIDTKTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQSSKNVYT 333

Query: 78 SVVNGQFTFDDKT 90  
SVVNG+FTFDDKT  
Sbjct: 334 SVVNGKFTFDDKT 346

tr Q54863 Phase-1 flagellin [fliC] [Salmonella 505 AA  
Q54863\_SALPU pullorum] [align](#)

Score = 146 bits (368), Expect = 1e-34  
Identities = 72/73 (98%), Positives = 73/73 (99%)

Query: 18 DTFDYKGVFTFTIDTKTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQSSKNVYT 77  
DTFDYKGVFTFTIDTKTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQSSKNVYT  
Sbjct: 274 DTFDYKGVFTFTIDTKTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQSSKNVYT 333

Query: 78 SVVNGQFTFDDKT 90  
SVVNG+FTFDDKT  
Sbjct: 334 SVVNGKFTFDDKT 346

tr Q54329 Phase-1 flagellin (Fragment) [fliC] [Salmonella enterica 504  
Q54329\_SALET subsp. AA  
enterica serovar Enteritidis var. jena] [align](#)

Score = 145 bits (367), Expect = 1e-34  
Identities = 72/73 (98%), Positives = 73/73 (99%)

Query: 18 DTFDYKGVFTFTIDTKTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQSSKNVYT 77  
DTFDYKGVFTFTIDTKTG+DNGKVSTTINGEKVTLTVADIATGATDVNAATLQSSKNVYT  
Sbjct: 273 DTFDYKGVFTFTIDTKTGNDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQSSKNVYT 332

Query: 78 SVVNGQFTFDDKT 90  
SVVNGQFTFDDKT  
Sbjct: 333 SVVNGQFTFDDKT 345

tr Q53989 Phase-1 flagellin (Fragment) [fliC] [Salmonella enterica 504  
Q53989\_SALET subsp. AA  
enterica serovar Essen] [align](#)

Score = 145 bits (367), Expect = 1e-34  
Identities = 72/73 (98%), Positives = 73/73 (99%)

Query: 18 DTFDYKGVFTFTIDTKTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQSSKNVYT 77  
DTFDYKGVFTFTIDTKTG+DNGKVSTTINGEKVTLTVADIATGATDVNAATLQSSKNVYT  
Sbjct: 273 DTFDYKGVFTFTIDTKTGNDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQSSKNVYT 332

Query: 78 SVVNGQFTFDDKT 90  
SVVNGQFTFDDKT

Sbjct: 333 SVVNGQFTFDDKT 345

tr Q53970 Phase-1 flagellin [fliC] [Salmonella 505 AA  
Q53970\_SALDU dublin] align

Score = 145 bits (367), Expect = 1e-34  
Identities = 72/73 (98%), Positives = 72/73 (98%)

Query: 18 DTFDYKGVFTFTIDTKTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQSSKNVYT 77  
DTFDYKGVFTFTIDTKTGDDGNGKVSTTINGEKVTLTVADIATGA DVNAATLQSSKNVYT

Sbjct: 274 DTFDYKGVFTFTIDTKTGDDGNGKVSTTINGEKVTLTVADIATGAADVNAATLQSSKNVYT 333

Query: 78 SVVNGQFTFDDKT 90  
SVVNGQFTFDDKT

Sbjct: 334 SVVNGQFTFDDKT 346

tr Q53967 Phase-1 flagellin (Fragment) [fliC] [Salmonella enterica 465  
Q53967\_SALET subsp. AA  
enterica serovar Enteritidis var. danyasz] align

Score = 145 bits (367), Expect = 1e-34  
Identities = 72/73 (98%), Positives = 73/73 (99%)

Query: 18 DTFDYKGVFTFTIDTKTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQSSKNVYT 77  
DTFDYKGVFTFTIDTKTG+DGNGKVSTTINGEKVTLTVADIATGATDVNAATLQSSKNVYT

Sbjct: 273 DTFDYKGVFTFTIDTKTGNDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQSSKNVYT 332

Query: 78 SVVNGQFTFDDKT 90  
SVVNGQFTFDDKT

Sbjct: 333 SVVNGQFTFDDKT 345

tr Q53822 Phase-1 flagellin (Fragment) [fliC] [Salmonella enterica 504  
Q53822\_SALET subsp. AA  
enterica serovar Enteritidis var. chaco] align

Score = 145 bits (367), Expect = 1e-34  
Identities = 72/73 (98%), Positives = 73/73 (99%)

Query: 18 DTFDYKGVFTFTIDTKTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQSSKNVYT 77  
DTFDYKGVFTFTIDTKTG+DGNGKVSTTINGEKVTLTVADIATGATDVNAATLQSSKNVYT

Sbjct: 273 DTFDYKGVFTFTIDTKTGNDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQSSKNVYT 332

Query: 78 SVVNGQFTFDDKT 90  
SVVNGQFTFDDKT

Sbjct: 333 SVVNGQFTFDDKT 345

tr Q79DB7 Phase 1 flagellin [fliC] [Salmonella enterica subsp. 505

Q79DB7\_SALET **enterica**  
**serovar Othmarschen]**

AA  
align

Score = 145 bits (366), Expect = 2e-34  
Identities = 72/73 (98%), Positives = 72/73 (98%)

Query: 18 DTFDYKGVFTFTIDTKTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQSSKNVYT 77  
DTFDYKGVFTFTIDTKTGDDGNGKVSTTINGEKVTLTVADIAT AFDVNAATLQSSKNVYT  
Sbjct: 274 DTFDYKGVFTFTIDTKTGDDGNGKVSTTINGEKVTLTVADIATSATDVNAATLQSSKNVYT 333

Query: 78 SVVNGQFTFDDKT 90  
SVVNGQFTFDDKT  
Sbjct: 334 SVVNGQFTFDDKT 346

tr Q6V2W1 **Phase 1 flagellin [fliC] [Salmonella** 505 AA  
Q6V2W1\_9ENTR **enterica]** align

Score = 145 bits (366), Expect = 2e-34  
Identities = 72/73 (98%), Positives = 72/73 (98%)

Query: 18 DTFDYKGVFTFTIDTKTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQSSKNVYT 77  
DTFDYKGVFTFTIDTKTGDDGNGKVSTTINGEKVTLTVADIA GATDVNAATLQSSKNVYT  
Sbjct: 274 DTFDYKGVFTFTIDTKTGDDGNGKVSTTINGEKVTLTVADIAIGATDVNAATLQSSKNVYT 333

Query: 78 SVVNGQFTFDDKT 90  
SVVNGQFTFDDKT  
Sbjct: 334 SVVNGQFTFDDKT 346

tr Q57381 **Phase-1 flagellin [fliC] [Salmonella** 505 AA  
Q57381\_SALEN **enteritidis]** align

Score = 145 bits (366), Expect = 2e-34  
Identities = 72/73 (98%), Positives = 72/73 (98%)

Query: 18 DTFDYKGVFTFTIDTKTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQSSKNVYT 77  
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Sbjct: 274 DTFDYKGVFTFTIDTKTGDDGNGKVSTTINGEKVTLTVADIATSATDVNAATLQSSKNVYT 333

Query: 78 SVVNGQFTFDDKT 90  
SVVNGQFTFDDKT  
Sbjct: 334 SVVNGQFTFDDKT 346

tr Q6V2U9 **Phase 1 flagellin [fliC] [Salmonella** 505 AA  
Q6V2U9\_9ENTR **enterica]** align

Score = 145 bits (365), Expect = 2e-34  
Identities = 72/73 (98%), Positives = 72/73 (98%)

Query: 18 DTFDYKGVFTFTIDTKTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQSSKNVYT 77  
DTFDYKGVFTFTIDTKTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQSSKNVYT

Sbjct: 274 DTFDYKGVFTFTIDTKTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQSSKNVYT 333

Query: 78 SVVNGQFTFDDKT 90  
SVVNGQFTFDDKT

Sbjct: 334 SVVNGQFTFDDKT 346

tr Q53993 Phase 1 flagellin [fliC] [Salmonella 508 AA  
Q53993\_9ENTR enterica] align

Score = 144 bits (364), Expect = 3e-34  
Identities = 71/73 (97%), Positives = 72/73 (98%)

Query: 18 DTFDYKGVFTFTIDTKTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQSSKNVYT 77  
DTFDYKGV+FTIDTKTGDDGNGKVSTTINGEKVTLTVADI TGATDVNAATLQSSKNVYT  
Sbjct: 277 DTFDYKGVSTFTIDTKTGDDGNGKVSTTINGEKVTLTVADIITGATDVNAATLQSSKNVYT 336

Query: 78 SVVNGQFTFDDKT 90  
SVVNGQFTFDDKT  
Sbjct: 337 SVVNGQFTFDDKT 349

sp O52959 Phase-1 flagellin [fliC] [Salmonella 504 AA  
FLIC\_SALNA naestved] align

Score = 143 bits (361), Expect = 7e-34  
Identities = 71/73 (97%), Positives = 71/73 (97%)

Query: 18 DTFDYKGVFTFTIDTKTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQSSKNVYT 77  
DTFDYKGVFTFTIDTKTGDDGNGKVSTTINGEKVTLTVADIA GA DVNAATLQSSKNVYT  
Sbjct: 273 DTFDYKGVFTFTIDTKTGDDGNGKVSTTINGEKVTLTVADIAIGAADVNAATLQSSKNVYT 332

Query: 78 SVVNGQFTFDDKT 90  
SVVNGQFTFDDKT  
Sbjct: 333 SVVNGQFTFDDKT 345

sp Q06971 Flagellin (Phase-1-C flagellin) [fliC] [Salmonella dublin] 504 AA  
FLIC\_SALDU align

Score = 143 bits (361), Expect = 7e-34  
Identities = 71/73 (97%), Positives = 71/73 (97%)

Query: 18 DTFDYKGVFTFTIDTKTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQSSKNVYT 77  
DTFDYKGVFTFTIDTKTGDDGNGKVSTTINGEKVTLTVADIA GA DVNAATLQSSKNVYT  
Sbjct: 273 DTFDYKGVFTFTIDTKTGDDGNGKVSTTINGEKVTLTVADIAIGAADVNAATLQSSKNVYT 332

Query: 78 SVVNGQFTFDDKT 90  
SVVNGQFTFDDKT  
Sbjct: 333 SVVNGQFTFDDKT 345

tr Q6V2V3 Phase 1 flagellin [fliC] [Salmonella] 505 AA  
Q6V2V3\_9ENTR enterica] align

Score = 143 bits (361), Expect = 7e-34  
Identities = 71/73 (97%), Positives = 71/73 (97%)

Query: 18 DTFDYKGVTFITIDTKTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQSSKNVYT 77  
DTFDYKGVTFITIDTKTGDDGNGKVSTTINGEKVTLTVADIA GA DVNAATLQSSKNVYT  
Sbjct: 274 DTFDYKGVTFITIDTKTGDDGNGKVSTTINGEKVTLTVADIAIGAADVNAATLQSSKNVYT 333  
Query: 78 SVVNGQFTFDDKT 90  
SVVNGQFTFDDKT  
Sbjct: 334 SVVNGQFTFDDKT 346

tr Q66PR3 Phase 1 flagellin [fliC] [Salmonella] 505 AA  
Q66PR3\_SALDU dublin] align

Score = 143 bits (361), Expect = 7e-34  
Identities = 71/73 (97%), Positives = 71/73 (97%)

Query: 18 DTFDYKGVTFITIDTKTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQSSKNVYT 77  
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Sbjct: 274 DTFDYKGVTFITIDTKTGDDGNGKVSTTINGEKVTLTVADIAIGAADVNAATLQSSKNVYT 333  
Query: 78 SVVNGQFTFDDKT 90  
SVVNGQFTFDDKT  
Sbjct: 334 SVVNGQFTFDDKT 346

tr Q6V2V2 Phase 1 flagellin [fliC] [Salmonella] 505 AA  
Q6V2V2\_9ENTR enterica] align

Score = 143 bits (361), Expect = 7e-34  
Identities = 71/73 (97%), Positives = 71/73 (97%)

Query: 18 DTFDYKGVTFITIDTKTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQSSKNVYT 77  
DTFDYKGVTFITIDTKTGDDGNGKVSTTINGEKVTLTVADIA GA DVNAATLQSSKNVYT  
Sbjct: 274 DTFDYKGVTFITIDTKTGDDGNGKVSTTINGEKVTLTVADIAIGAADVNAATLQSSKNVYT 333  
Query: 78 SVVNGQFTFDDKT 90  
SVVNGQFTFDDKT  
Sbjct: 334 SVVNGQFTFDDKT 346

tr Q66PR5 Phase 1 flagellin [fliC] [Salmonella] 505 AA  
Q66PR5\_SALNA naestved] align

Score = 143 bits (361), Expect = 7e-34  
Identities = 71/73 (97%), Positives = 71/73 (97%)

Query: 18 DTFDYKGVTFITIDTKTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQSSKNVYT 77  
DTFDYKGVTFITIDTKTGDDGNGKVSTTINGEKVTLTVADIA GA DVNAATLQSSKNVYT

Sbjct: 274 DTFDYKGVTFITIDTKTGDDGNGKVSTTINGEKVTLTVADIAIGAADVNAATLQSSKNVYT 333

Query: 78 SVVNGQFTFDDKT 90  
SVVNGQFTFDDKT

Sbjct: 334 SVVNGQFTFDDKT 346

sp Q06981 Flagellin (Phase-1-D flagellin) [fliC] [Salmonella moscow] 504 AA  
FLIC\_SALMC

align

Score = 143 bits (360), Expect = 9e-34

Identities = 71/73 (97%), Positives = 72/73 (98%)

Query: 18 DTFDYKGVTFITIDTKTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQSSKNVYT 77  
DTFDYKGVTFITIDTKTGDDGNGKVSTTINGEKVTLTVADIATGAT+VNAATLQSSKNVYT

Sbjct: 273 DTFDYKGVTFITIDTKTGDDGNGKVSTTINGEKVTLTVADIATGATNVNAATLQSSKNVYT 332

Query: 78 SVVNGQFTFDDKT 90  
SVVNGQFTFDDKT

Sbjct: 333 SVVNGQFTFDDKT 345

tr Q66PR2 Phase 1 flagellin [fliC] [Salmonella 505 AA  
Q66PR2\_SALMC moscow] align

Score = 143 bits (360), Expect = 9e-34

Identities = 71/73 (97%), Positives = 72/73 (98%)

Query: 18 DTFDYKGVTFITIDTKTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQSSKNVYT 77  
DTFDYKGVTFITIDTKTGDDGNGKVSTTINGEKVTLTVADIATGAT+VNAATLQSSKNVYT

Sbjct: 274 DTFDYKGVTFITIDTKTGDDGNGKVSTTINGEKVTLTVADIATGATNVNAATLQSSKNVYT 333

Query: 78 SVVNGQFTFDDKT 90  
SVVNGQFTFDDKT

Sbjct: 334 SVVNGQFTFDDKT 346

tr Q6V2V0 Phase 1 flagellin [fliC] [Salmonella 505 AA  
Q6V2V0\_9ENTR enterica] align

Score = 143 bits (360), Expect = 9e-34

Identities = 71/73 (97%), Positives = 72/73 (98%)

Query: 18 DTFDYKGVTFITIDTKTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQSSKNVYT 77  
DTFDYKGVTFITIDTKTGDDGNGKVSTTINGEKVTLTVADIATGAT+VNAATLQSSKNVYT

Sbjct: 274 DTFDYKGVTFITIDTKTGDDGNGKVSTTINGEKVTLTVADIATGATNVNAATLQSSKNVYT 333

Query: 78 SVVNGQFTFDDKT 90  
SVVNGQFTFDDKT

Sbjct: 334 SVVNGQFTFDDKT 346

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# UniProtKB/TrEMBL

## entry Q54414

[Printer-friendly view](#)[Request update](#)[Q5](#)[\[Entry info\]](#) [\[Name and origin\]](#) [\[References\]](#) [\[Comments\]](#) [\[Cross-references\]](#) [\[Keywords\]](#)  
[\[Features\]](#) [\[Sequence\]](#) [\[Tools\]](#)

*Note: most headings are clickable, even if they don't appear as links. They link to the user manual or other documents.*

### Entry information

Entry name	Q54414_SALET	
Primary accession number	Q54414	
Secondary accession numbers	None	
Entered in TrEMBL in	Release 01, November 1996	
Sequence was last modified in	Release 01, November 1996	
Annotations were last modified in	Release 24, June 2003	
Name and origin of the protein		
Protein name	Phase-1 flagellin [Fragment]	
Synonyms	None	
Gene name	Name: <i>fliC</i>	
From	Salmonella enterica subsp. enterica serovar Marritens	[TaxID: 29479]
Taxonomy	Bacteria; Proteobacteria; Gammaproteobacteria; Enterobacteriales; Enterobacteriaceae; Salmonella.	

### References

- [1] NUCLEOTIDE SEQUENCE.  
**STRAIN=DIJK**;  
 Masten B.J., Joys T.M.;  
 Submitted (JAN-1994) to the EMBL/GenBank/DDBJ databases.

### Comments

None

### Cross-references

EMBL	U05301; AAA53496.1; -; Genomic_DNA.	[EMBL / GenBank / DDBJ] [CoDingSequence]
HSSP	P06179; 1UCU. [HSSP ENTRY / PDB]	
	GO:0009420; Cellular component: flagellar filament (sensu Bacteria) ( <i>inferred from electronic annotation</i> ).	
	GO:0005198; Molecular function: structural molecule activity ( <i>inferred from electronic annotation</i> ).	
GO	GO:0001539; Biological process: ciliary or flagellar motility ( <i>inferred from electronic annotation</i> ).	
	QuickGo view.	
	IPR001029; Flagellin_C.	

InterPro IPR001492; Flagellin\_N.  
Graphical view of domain structure.

Pfam PF00700; Flagellin\_C; 1.  
PF00669; Flagellin\_N; 1.  
Pfam graphical view of domain structure.

PRINTS PR00207; FLAGELLIN.

ProDom PD000316; Flagellin\_C; 1.  
[Domain structure / List of seq. sharing at least 1 domain]

HOGENOM [Family / Alignment / Tree]

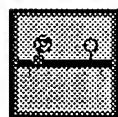
ProtoMap Q54414.

PRESAGE Q54414.

ModBase Q54414.

SWISS-2DPAGE Get region on 2D PAGE.

UniRef View cluster of proteins with at least 50% / 90% identity.

**Keywords****Flagellum.****Features**

Feature table viewer

Key	From	To	Length	Description
NON_TER	1	1		

**Sequence information**

Length: **503 AA** [This is the length of the partial sequence]      Molecular weight: **52672 Da** [This is the MW of the partial sequence]      CRC64: **5652466F0E613C46** [This is a checksum on the sequence]

<u>10</u>	<u>20</u>	<u>30</u>	<u>40</u>	<u>50</u>	<u>60</u>
AQVINTNSLS	LLTQNNLNKS	QSALGTAIER	LSSGLRINSA	KDDAAGQAIA	NRFTSNIKGL
<u>70</u>	<u>80</u>	<u>90</u>	<u>100</u>	<u>110</u>	<u>120</u>
TQASRNANDG	ISIAQTTEGA	LNEINNNLQR	VRELSVQATN	GTNSDSLKLS	IQDEIQQRLS
<u>130</u>	<u>140</u>	<u>150</u>	<u>160</u>	<u>170</u>	<u>180</u>
EIDRVSNQTQ	FNGVKVLSQD	NQMKIQVGAN	DGETITIDLQ	KIDVKSLGLD	GfNVNGPKEA
<u>190</u>	<u>200</u>	<u>210</u>	<u>220</u>	<u>230</u>	<u>240</u>
TVGDLKSSFK	NVTGYDITYA	GANTYRVDIN	SGAVTDDAGT	DKIYVNAANG	QLTTDDAQNN
<u>250</u>	<u>260</u>	<u>270</u>	<u>280</u>	<u>290</u>	<u>300</u>
TAVDLFKTTK	SSAGTAESKA	IAGAIKGGKE	GDTFDYKGVs	FTIDTKNGAD	GNGTVSTMIN
<u>310</u>	<u>320</u>	<u>330</u>	<u>340</u>	<u>350</u>	<u>360</u>
GEKVTILTVA	ITAGAADVNA	ATLQSSKNVY	TSVVNGQFTF	DDKTKNESAK	LSDLEANNAV
<u>370</u>	<u>380</u>	<u>390</u>	<u>400</u>	<u>410</u>	<u>420</u>
KGESKITVNG	AEYTANAEGD	KVTLAGKTMF	IDKTASGVST	LINEDAAAAK	KSTANPLASI
<u>430</u>	<u>440</u>	<u>450</u>	<u>460</u>	<u>470</u>	<u>480</u>
DSALSKVDAV	RSSLGAIQNR	FDSAITNLGN	TVNNLSSARS	RIEDSDYATE	VSNMSRAQIL

490 500  
QQAGTSVLAQ ANQVPQSVLS LLR

Q54414 in FASTA  
format

*View entry in original UniProtKB/TrEMBL format*

*View entry in raw text format (no links)*

*Request for annotation of this UniProtKB/TrEMBL entry*

BLAST

BLAST submission on  
ExPASy/SIB  
or at NCBI (USA)



Sequence analysis tools: ProtParam, ProtScale,  
Compute pI/Mw, PeptideMass, PeptideCutter,  
Dotlet (Java)



ScanProsite, MotifScan



Submit a homology modeling request to SWISS-  
MODEL



NPSA Sequence analysis  
tools



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## WEST Search History

DATE: Wednesday, July 06, 2005

Hide?	Set Name	Query	Hit Count
		<i>DB=PGPB,USPT,USOC,EPAB,JPAB,DWPI,TDBD; PLUR=YES; OP=AND</i>	
<input type="checkbox"/>	L1	STTINGEKVTL	0
<input type="checkbox"/>	L2	STTINGEKVTL\$	0
<input type="checkbox"/>	L3	\$STTINGEKVTL\$	0

END OF SEARCH HISTORY

## 7. Document ID: US 20030232055 A1

L4: Entry 7 of 60

File: PGPB

Dec 18, 2003

DOCUMENT-IDENTIFIER: US 20030232055 A1

TITLE: Innate immune system-directed vaccines

Detail Description Paragraph:

[0291] Full-length Salmonella typhimurium Flagellin and E coli Flagellin were cloned from the respective genomic DNAs and expressed as recombinant proteins in E coli. Flagellin was expressed alone, or as a fusion protein with antigenic epitopes from ovalbumin (SIINFEEKL), tyrosinase-2 protein (TRP2) cloned from murine B16 cells, or the C-terminal fragment of I-E.alpha. protein, which contains the E.alpha. epitope. In addition, all of the recombinant proteins contained a C-terminal 6.times.-histidine repeat to aid in purification.

DERWENT-ACC-NO: 2004-517400

DERWENT-WEEK: 200474

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TITLE: Salmonella antigen formulation useful for identifying SE-infected fowl and fowl inoculated with SE-attenuated vaccine, comprising Salmonella enteritidis flagellin 9 kDa polypeptide

Basic Abstract Text (1):

NOVELTY - Salmonella antigen formulation (I) comprising Salmonella enteritidis flagellin (SE FliC) 9 kDa polypeptide (II) or its composite, which is used as a marker antigen for identifying SE-infected animal and animal inoculated with SE-attenuated vaccine, where (II) is obtained from 53 kDa flagellin polypeptide of Salmonella sp., is new.

DERWENT-ACC-NO: 2004-517400  
DERWENT-WEEK: 200474  
COPYRIGHT 2005 DERWENT INFORMATION LTD

TITLE: Salmonella antigen formulation useful for identifying SE-infected fowl and fowl inoculated with SE-attenuated vaccine, comprising Salmonella enteritidis flagellin 9 kDa polypeptide

INVENTOR: EKAWA, T; OHTA, H ; TOYATA, Y ; YAMAMOTO, S

PATENT-ASSIGNEE:

ASSIGNEE

CAF LAB INC

CODE

CAFCN

PRIORITY-DATA: 2002WO-JP13148 (December 16, 2002)

Search Selected

Search ALL

Clear

PATENT-FAMILY:

PUB-NO	PUB-DATE	LANGUAGE	PAGES	MAIN-IPC
<input type="checkbox"/> <u>AU 2002359984 A1</u>	July 9, 2004		000	C07K014/255
<input type="checkbox"/> <u>WO 2004055045 A1</u>	July 1, 2004	J	036	C07K014/255

DESIGNATED-STATES: AE AG AL AM AT AU AZ BA BB BG BR BY BZ CA CH CN CO CR CU CZ DE DK DM DZ EC EE ES FI GB GD GE GH GM HR HU ID IL IN IS JP KE KG KP KR KZ LC LK LR LS LT LU LV MA MD MG MK MN MW MX MZ NO NZ OM PH PL PT RO RU SC SD SE SG SK SL TJ TM TN TR TT TZ UA UG US UZ VC VN YU ZA ZM ZW AT BE BG CH CY CZ DE DK EA EE ES FI FR GB GH GM GR IE IT KE LS LU MC MW MZ NL OA PT SD SE SI SK SL SZ TR TZ UG ZM ZW

APPLICATION-DATA:

PUB-NO	APPL-DATE	APPL-NO	DESCRIPTOR
AU2002359984A1	December 16, 2002	2002AU-0359984	
AU2002359984A1	December 16, 2002	2002WO-JP13148	
AU2002359984A1		WO2004055045	Based on
WO2004055045A1	December 16, 2002	2002WO-JP13148	

INT-CL (IPC): A61 K 39/00; A61 K 39/112; A61 P 31/04; C07 K 14/255; G01 N 33/53; G01 N 33/569

ABSTRACTED-PUB-NO: WO2004055045A

BASIC-ABSTRACT:

NOVELTY - Salmonella antigen formulation (I) comprising Salmonella enteritidis flagellin (SE FliC) 9 kDa polypeptide (II) or its composite, which is used as a marker antigen for identifying SE-infected animal and animal inoculated with SE-attenuated vaccine, where (II) is obtained from 53 kDa flagellin polypeptide of Salmonella sp., is new.

## DETAILED DESCRIPTION - INDEPENDENT CLAIMS are also included for:

(1) kit (III) for detecting antibody with respect to Salmonella antigen, in fluid sample such as blood serum, egg yolk, body fluids or tissue extracts, by immunoenzymatic technique, comprising support material (I), various control blood serum, blood serum dilution liquid, conjugate dilution liquid and ortho phenylene-diamine dilution liquid; and

(2) Salmonella, preferably S.enteritidis sub-unit vaccine for protecting animal against infection of Salmonella, preferably S.enteritidis, comprising (II) as an antigen.

ACTIVITY - Antibacterial.

No supporting data is given.

## MECHANISM OF ACTION - Vaccine (claimed)

USE - (I) is useful for identifying SE-infected animal and animal inoculated with SE-attenuated vaccine. (III) is useful for serologically identifying S.enteritidis infection in hen, and hen vaccinated with SE-attenuated vaccine (claimed). (I) is useful as serological marker, for serologically testing and SE-infected fowl and fowl inoculated with an SE-attenuated vaccine marked today.

ADVANTAGE - (I) enables preparation of SE subunit vaccine exhibiting low stress-responsiveness. (I) enables identification of the fowl inoculated with an SE-attenuated vaccine.

CHOSEN-DRAWING: Dwg.0/4

TITLE-TERMS: SALMONELLA ANTIGEN FORMULATION USEFUL IDENTIFY INFECT FOWL  
FOWL INOCULATE ATTENUATE VACCINE COMPRISE SALMONELLA FLAGELLIN  
POLYPEPTIDE

DERWENT-CLASS: B04 C06 D16 S03

CPI-CODES: B04-B04C1; B04-B04D4; B04-B04D5; B04-G07; B04-L04; B04-N03; B04-N08; B11-C07A4; B12-K04A4; B14-A01A8; B14-S11B; C04-B04C1; C04-B04D4; C04-B04D5; C04-G07; C04-L04; C04-N03; C04-N08; C11-C07A4; C12-K04A4; C14-A01A8; C14-S11B; D05-H07; D05-H09; D05-H11;

EPI-CODES: S03-E14H4;

CHEMICAL-CODES:

Chemical Indexing M1 \*01\*  
Fragmentation Code  
M423 M770 M781 M905 Q233  
Specific Compounds  
A0CHOK A0CHOU

Chemical Indexing M6 \*02\*  
Fragmentation Code  
M905 P001 P220 Q233 R515 R521 R621 R622 R624 R630  
R635

SECONDARY-ACC-NO:

CPI Secondary Accession Numbers: C2004-190975

Non-CPI Secondary Accession Numbers: N2004-410005

DERWENT-ACC-NO: 2003-117767  
DERWENT-WEEK: 200311  
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TITLE: Egg yolk antibody against salmonella

INVENTOR: KIM, J U

PATENT-ASSIGNEE: DAN BIOTECH (DANBN)

PRIORITY-DATA: 2000KR-0085807 (December 29, 2000)

Search Selected

Search ALL

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PATENT-FAMILY:

PUB-NO	PUB-DATE	LANGUAGE	PAGES	MAIN-IPC
<input type="checkbox"/> <u>KR 2002056452 A</u>	July 10, 2002		001	C07K016/02

APPLICATION-DATA:

PUB-NO	APPL-DATE	APPL-NO	DESCRIPTOR
KR2002056452A	December 29, 2000	2000KR-0085807	

INT-CL (IPC): C07 K 16/02

ABSTRACTED-PUB-NO: KR2002056452A

BASIC-ABSTRACT:

NOVELTY - An egg yolk antibody (IgY) against Salmonella including Salmonella choleresuis, Salmonella enteritidis, Salmonella typhimurium, Salmonella dubrin and Salmonella gallinarium, is new. It can be used for the prevention and treatment of Salmonella.

DETAILED DESCRIPTION - The egg yolk antibody (IgY) against Salmonella is characteristically isolated by injecting flagella protein or crude OMPs of Salmonella inducing diseases in livestock, into an animal then isolating an antibody from the egg of the animal, wherein Salmonella is at least one selected from the group consisting of Salmonella choleresuis, Salmonella enteritidis, Salmonella typhimurium, Salmonella dubrin and Salmonella gallinarium.

ABSTRACTED-PUB-NO: KR2002056452A

EQUIVALENT-ABSTRACTS:

CHOSEN-DRAWING: Dwg. 1/10

DERWENT-CLASS: B04 D16

CPI-CODES: B04-G07; B14-A01A8; D05-H11;

DERWENT-ACC-NO: 2002-737817  
DERWENT-WEEK: 200280  
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TITLE: Specific egg yolk antibody(igy) against salmonella

INVENTOR: KIM, J U

PATENT-ASSIGNEE: DAN BIOTECH (DANBN)

PRIORITY-DATA: 2000KR-0063411 (October 27, 2000)

Search Selected

Search ALL

Clear

PATENT-FAMILY:

PUB-NO	PUB-DATE	LANGUAGE	PAGES	MAIN-IPC
<input type="checkbox"/> <u>KR 2002032772 A</u>	May 4, 2002		001	C07K016/02

APPLICATION-DATA:

PUB-NO	APPL-DATE	APPL-NO	DESCRIPTOR
KR2002032772A	October 27, 2000	2000KR-0063411	

INT-CL (IPC): C07 K 16/02

ABSTRACTED-PUB-NO: KR2002032772A

BASIC-ABSTRACT:

NOVELTY - Specific egg yolk antibody (immunoglobulin (Ig)Y) against Salmonella is provided, which can be effectively used in the prevention, treatment and diagnosis of Salmonella infection.

DETAILED DESCRIPTION - The specific IgY against Salmonella is prepared by introducing the flagella protein of Salmonella into an animal to induce immunization, and separating antibodies from the serum or egg yolk of the immunized animal, in which the Salmonella is Salmonella enteritidis or Salmonella typhimurium, the animal is a hen. The Salmonella antibody containing egg is obtained from an animal immunized with the flagella protein of Salmonella, in which the Salmonella is Salmonella enteritidis or Salmonella typhimurium, the animal is a hen.

ABSTRACTED-PUB-NO: KR2002032772A

EQUIVALENT-ABSTRACTS:

CHOSEN-DRAWING: Dwg.1/10

DERWENT-CLASS: B04 D16

CPI-CODES: B04-G07; B14-A01A8; D05-H11;

DERWENT-ACC-NO: 2001-071400  
 DERWENT-WEEK: 200279  
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TITLE: New method for the specific detection of Salmonella enteritidis infections of poultry comprises contacting a biological sample with antigenic fragments of S. enteritidis fimbrial and/or flagellin proteins

INVENTOR: KWANG, H; LIU, W ; LOH, K Y H ; LOW, S S

PATENT-ASSIGNEE: INST MOLECULAR AGROBIOLOGY (MOLEN)

PRIORITY-DATA: 1999WO-SG00061 (June 22, 1999)

Search Selected	Search All	Clear
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PATENT-FAMILY:

PUB-NO	PUB-DATE	LANGUAGE	PAGES	MAIN-IPC
<input type="checkbox"/> <u>CN 1361828 A</u>	July 31, 2002		000	C12Q001/10
<input type="checkbox"/> <u>WO 200078995 A1</u>	December 28, 2000	E	047	C12Q001/10
<input type="checkbox"/> <u>AU 9948172 A</u>	January 9, 2001		000	C12Q001/10

DESIGNATED-STATES: AE AL AM AT AU AZ BA BB BG BR BY CA CH CN CU CZ DE DK EE ES FI GB GD GE GH GM HR HU ID IL IN IS JP KE KG KP KR KZ LC LK LR LS LT LU LV MD MG MK MN MW MX NO NZ PL PT RO RU SD SE SG SI SK SL TJ TM TR TT UA UG US UZ VN YU ZA ZW AT BE CH CY DE DK EA ES FI FR GB GH GM GR IE IT KE LS LU MC MW NL OA PT SD SE SL SZ UG ZW

APPLICATION-DATA:

PUB-NO	APPL-DATE	APPL-NO	DESCRIPTOR
CN 1361828A	June 22, 1999	1999CN-0816757	
CN 1361828A	June 22, 1999	1999WO-SG00061	
WO 200078995A1	June 22, 1999	1999WO-SG00061	
AU 9948172A	June 22, 1999	1999AU-0048172	
AU 9948172A	June 22, 1999	1999WO-SG00061	
AU 9948172A		WO 200078995	Based on

INT-CL (IPC): C07 K 14/255; C12 Q 1/10

ABSTRACTED-PUB-NO: WO 200078995A  
 BASIC-ABSTRACT:

NOVELTY - A method for detecting Salmonella enteritidis in a biological sample obtained from poultry comprising contacting the sample with an antigenic fragment of S. enteritidis fimbrial or flagellin protein and detecting the formation of a complex, where the fragment specifically recognizes S. enteritidis antibodies, is new.

DETAILED DESCRIPTION - A method for detecting *Salmonella enteritidis* in a biological sample obtained from poultry comprises:

- (a) contacting the sample with an antigenic fragment of *S. enteritidis* fimbrial or flagellin protein under conditions conducive to formation of an immunological complex between *S. enteritidis* antibodies and the fragment; and
- (b) detecting the formation of a complex, where the fragment specifically recognizes *S. enteritidis* antibodies present in the sample and discriminates between *S. enteritidis* and other *Salmonella* spp.

INDEPENDENT CLAIMS are also included for the following:

- (1) an isolated fragment of *S. enteritidis* fimbrial protein (I) having a fully defined 128 amino acid (aa) sequence (given in the specification), an antigenic fragment of (I) or (I) with a conservative amino acid substitution for at least one amino acid;
- (2) an isolated fragment of *S. enteritidis* flagellin protein (II) having a fully defined 69, 40, 27 or 11 aa sequence (given in the specification), an antigenic fragment of (II) or (II) with a conservative amino acid substitution for at least one amino acid;
- (3) a kit comprising:
  - (a) a fragment of *S. enteritidis* fimbrial or flagellin protein which specifically recognizes *S. enteritidis* antibodies present in a biological sample obtained from poultry suspected of being infected with *S. enteritidis* and which discriminates between antibodies from *S. enteritidis* and other *Salmonella* spp.;
  - (b) a detectable label;
- (4) a kit comprising:
  - (a) a fragment of *S. enteritidis* fimbrial and flagellin protein, each of which specifically recognizes *S. enteritidis* antibodies present in a biological sample obtained from poultry suspected of being infected with *S. enteritidis* and which discriminates between antibodies from *S. enteritidis* and other *Salmonella* spp.; and
  - (b) a detectable label;
- (5) a method for detecting *Salmonella enteritidis* in a biological sample obtained from poultry comprising:
  - (a) contacting a first portion of the sample with an antigenic fragment of *S. enteritidis* fimbrial protein under conditions conducive to formation of an immunological complex between *S. enteritidis* antibodies and the fragment;
  - (b) detecting the formation of a complex, where the fragment specifically recognizes *S. enteritidis* antibodies present in the sample and discriminates between *S. enteritidis* and other *Salmonella* spp.;
  - (c) contacting a second portion of the sample with an antigenic fragment of *S. enteritidis* flagella protein under conditions conducive to formation of an immunological complex between *S. enteritidis* antibodies and the fragment;



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If your question is not covered, please contact [<helpdesk@expasy.org>](mailto:helpdesk@expasy.org).

NCBI BLAST program reference [PMID:9254694]:

Altschul S.F., Madden T.L., Schäffer A.A., Zhang J., Zhang Z., Miller W., Lipman D.J. Gapped BLAST and PSI-BLAST: a new generation of protein database search programs. Nucleic Acids Res. 25:3389-3402(1997).

Query: 145 AA (of which 23% low-complexity regions filtered out)

Date run: 2005-07-06 11:24:09 UTC+0100 on sib-gml.unil.ch

Program: NCBI BLASTP 1.5.4-Paracel [2003-06-05]

Database: EXPASY/UniProtKB

2,035,690 sequences; 659,769,346 total letters

UniProt Knowledgebase Release 5.4 consists of:

UniProtKB/Swiss-Prot Release 47.4 of 05-Jul-2005: 186882 entries

UniProtKB/TrEMBL Release 30.4 of 05-Jul-2005: 1837312 entries

[Taxonomic view](#)

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[Printable view](#)

List of potentially matching sequences

Send selected sequences to

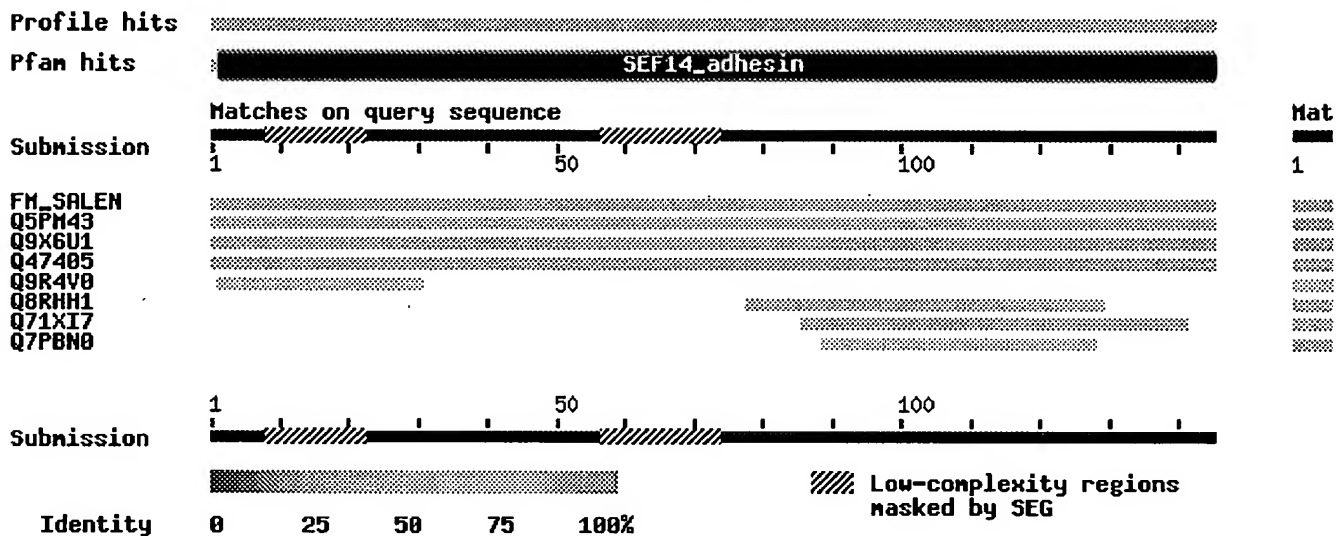
☐ Include query sequence

Db AC	Description	Score	E-value
<input type="checkbox"/> sp <a href="#">F12061</a>	FM_SALEN Fimbrial protein precursor [sefA] [Salmonella...	226	9e-59
<input type="checkbox"/> tr <a href="#">Q5PM43</a>	_SALPA Fimbrial structural protein [sefA] [Salmonella p...	216	7e-56
<input type="checkbox"/> tr <a href="#">Q9X6U1</a>	_ECOLI CS22 adhesin protein [cseA] [Escherichia coli]	87	6e-17
<input type="checkbox"/> tr <a href="#">Q47405</a>	_ECOLI Antigen 8786 [nfaA] [Escherichia coli]	82	2e-15
<input type="checkbox"/> tr <a href="#">Q9R4V0</a>	_SALEN Fimbrial protein SEF14 (Fragment) [Salmonella en...	33	1.1
<input type="checkbox"/> tr <a href="#">Q8RHH1</a>	_FUSNN Fusobacterium outer membrane protein family [FN2...	31	5.3
<input type="checkbox"/> tr <a href="#">Q71XI7</a>	_LISMF Cell wall surface anchor family protein [LMOF236...	30	6.9
<input type="checkbox"/> tr <a href="#">Q7PBN0</a>	_RICSI Hypothetical protein [rsib_orf.185] [Rickettsia ...	30	9.0

## Graphical overview of the alignments

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([Help](#)) (use [ScanProsite](#) for more details about PROSITE matches)



## Alignments

sp [P12061](#) Fimbrial protein precursor [sefA] [Salmonella enteritidis] 165 AA  
FM\_SALEN

[align](#)

Score = 226 bits (575), Expect = 9e-59

Identities = 112/145 (77%), Positives = 112/145 (77%)

Query: 1 AAGFVGKXXXXXXXXXXXXXXXXXANWSQDPGFTGPAVAAGQKVGTL SITATGPHNXXXX 60  
AAGFVGK SANWSQDPGFTGPAVAAGQKVGTL SITATGPHN

Sbjct: 21 AAGFVGKAVVQAAVTIAAQNTTSANWSQDPGFTGPAVAAGQKVGTL SITATGPHNSVSI 80

Query: 61 XXXXXXXXXXXXXXXPFVDGQGQPVFRGRIQGANINDQANTGIDGLAGWRVASSQETLNVP 120  
PFVDGQGQPVFRGRIQGANINDQANTGIDGLAGWRVASSQETLNVP

Sbjct: 81 AGKGASVSGGVATVPFVDGQGQPVFRGRIQGANINDQANTGIDGLAGWRVASSQETLNVP 140

Query: 121 VTTFGKSTLPAGTFTATFYVQQYQN 145  
VTTFGKSTLPAGTFTATFYVQQYQN

Sbjct: 141 VTTFGKSTLPAGTFTATFYVQQYQN 165

tr [Q5PM43](#) Fimbrial structural protein [sefA] [Salmonella  
Q5PM43\_SALPA paratyphi-a]

165

AA

[align](#)

Score = 216 bits (550), Expect = 7e-56

Identities = 107/145 (73%), Positives = 108/145 (73%)

Query: 1 AAGFVGNKXXXXXXXXXXXXXXXXXSANWSQDPGFTGPAAVAGQKVGTL SITATGPHNXXXX 60  
 AAGFVGNK SANWSQDPGFTGPAAVAGQKVGTL SITATGPHN  
 Sbjct: 21 AAGFVGNKAEVQA AVTIAA QNTTSANWSQDPGFTGPAAVAGQKVGTL SITATGPHNSVSI 80

Query: 61 XXXXXXXXXXXXXXXPFVDGQGQPVFRGRIQGANINDQANTGIDGLAGWRVASSQETLNVP 120  
 PFVDGQGQPVFRGRIQ ANINDQ NTGIDG AGWRVASSQETLNVP  
 Sbjct: 81 AGKGASVSGGVATVPFVDGQGQPVFRGRIQANINDQVNTGIDGFAGWRVASSQETLNVP 140

Query: 121 VTTFGKSTLPAGTFTATFYVQQYQN 145  
 VTTFG+STLPAG FTATFYVQQYQN  
 Sbjct: 141 VTTFGESTLPAGAFTATFYVQQYQN 165

tr Q9X6U1 CS22 adhesin protein [cseA] [Escherichia coli] 166 AA  
Q9X6U1\_ECOLI align

Score = 87.0 bits (214), Expect = 6e-17  
 Identities = 52/148 (35%), Positives = 74/148 (49%), Gaps = 4/148 (2%)

Query: 1 AAGFVGNKXXXXXXXXXXXXXXXXXSANWSQDPGFTGPAAVAGQKVGTL SITATGPHNXXXX 60  
 AA VG+ +A W+QDP +G +V A QK+GTL+I TG H  
 Sbjct: 20 AATVVG DVATVQAPVVFSAQNTINATWTQDPSVSGSSVQAMQKLGT LN IQLTGSHAGVYV 79

Query: 61 XXXXXXXXXXXXXXXPFVDGQGQPVFRGRIQGANINDQANTGIDGLA--GWRVASSQETLN 118  
 PF + GQ ERGR A+I +NT I G + GW + + ++  
 Sbjct: 80 SGDGTGVSGGLVTIPFKNAAGQIPFRGR-TNADIGQASNTLIAGHSGPGWNL PDAGNNIS 138

Query: 119 VPVTTFGKS-TLPAGTFTATFYVQQYQN 145  
 + + F K+ +PAGT+TATFY+QYQ+  
 Sbjct: 139 LDIKAFQKNDNIPAGTYTATFYIQYQS 166

tr Q47405 Antigen 8786 [nfaA] [Escherichia coli] 166 AA  
Q47405\_ECOLI align

Score = 82.4 bits (202), Expect = 2e-15  
 Identities = 50/148 (33%), Positives = 70/148 (46%), Gaps = 4/148 (2%)

Query: 1 AAGFVGNKXXXXXXXXXXXXXXXXXSANWSQDPGFTGPAAVAGQKVGTL SITATGPHNXXXX 60  
 AA VG+ +A W+QD +G +V A QK+GTL+I TG H  
 Sbjct: 20 AATAVG DVATVRAPLVFSAQNTINATWTQDSSVSGSSVTAMQKLGT LN IRLTGSHAGVYV 79

Query: 61 XXXXXXXXXXXXXXXPFVDGQGQPVFRGRIQGANINDQANTGIDGLA--GWRVASSQETLN 118  
 PF + GQ +ERGR A I T I G + GW + +Q+ N  
 Sbjct: 80 SGDDTGESGGLITIPFKNTAGQVLFGR-TNAEIGQAMTTPIVGHSGPGWHLPGTQDNFN 138

Query: 119 VPVTTF-GKSTLPAGTFTATFYVQQYQN 145  
 + + F + +PAG +TATFY+QYQ+  
 Sbjct: 139 LDIRAFQNNIPAGEYTATFYIQYQS 166

tr Q9R4V0 Fimbrial protein SEF14 (Fragment) [Salmonella enteritidis] 30 AA  
Q9R4V0\_SALEN

align

Score = 33.1 bits (74), Expect = 1.1  
Identities = 14/30 (46%), Positives = 15/30 (49%)

Query: 2 AGFVGNKXXXXXXXXXXXXXXXXXXSANWSQDP 31  
AGFVGNK SANW+QDP  
Sbjct: 1 AGFVGNKAEVQAAVTIAAQNTTSANWNQDP 30

tr Q8RHH1 Fusobacterium outer membrane protein family [FN2058] 1794  
Q8RHH1\_FUSNN [Fusobacterium  
nucleatum (subsp. nucleatum)] AA  
align

Score = 30.8 bits (68), Expect = 5.3  
Identities = 19/52 (36%), Positives = 26/52 (49%)

Query: 78 DGQGQPVFRGRIQGANINDQANTGIDGLAGWRVASSQETLNPVTTFGKSTL 129  
DGQG + G I N + +A I+G AG +TL+VP KST+  
Sbjct: 1227 DGQGTNLGAGNIDVQNGSAEATKNIEGTAGGDKRFGDKTSLVPGGRTKSTI 1278

tr Q71XI7 Cell wall surface anchor family protein [LMOf2365\_2211] 1697  
Q71XI7\_LISMF [Listeria  
monocytogenes (serotype 4b / strain F2365)] AA  
align

Score = 30.4 bits (67), Expect = 6.9  
Identities = 17/57 (29%), Positives = 29/57 (50%), Gaps = 1/57 (1%)

Query: 86 RGRIQGANINDQANTGIDGLAGWRVASSQETLNPVTTFGKS-TLPAGTFTATFYVQ 141  
R ++ NI D+ +TG+ L + V + + +N + T GK T+ A FY+Q  
Sbjct: 589 RIKMGNLNTDEFSTGVKALKSYTVRAYTDNINSVLLTEGKDYTIDKDVTPAGFYIQ 645

tr Q7PBN0 Hypothetical protein [rsib\_orf.185] [Rickettsia 149  
Q7PBN0\_RICSI sibirica] AA  
align

Score = 30.0 bits (66), Expect = 9.0  
Identities = 22/45 (48%), Positives = 27/45 (59%), Gaps = 12/45 (26%)

Query: 89 IQGANINDQANT-----GIDGLAGWRVASSQETLNPVTTFGKST 128  
+Q ANIN Q+NT ID +ASSQE L+ TTFGKS+  
Sbjct: 89 VQGANINPQSNTVSRSSSID-----GIASSQEELS---TTFGKSS 126

Database: EXPASY/UniProtKB

Posted date: Jul 4, 2005 6:23 AM

Number of letters in database: 659,769,346

Number of sequences in database: 2,035,690

Lambda	K	H
0.314	0.132	0.398

## Gapped

Lambda	K	H
0.267	0.0410	0.140

Matrix: BLOSUM62

Gap Penalties: Existence: 11, Extension: 1

length of query: 145

length of database: 659,769,346

effective HSP length: 121

effective length of query: 24

effective length of database: 413,450,856

effective search space: 9922820544

effective search space used: 9922820544

T: 11

A: 40

X1: 16 ( 7.2 bits)

X2: 38 (14.6 bits)

X3: 64 (24.7 bits)

S1: 42 (21.9 bits)

S2: 66 (30.0 bits)

Wallclock time: 2 seconds

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FileUp

MSF: 165 Type: P Check: 6009 ..

Name: sp|P12061|FM\_SALEN oo Len: 165 Check: 5260 Weight: 0.100

Name: tr|Q5PM43|Q5PM43\_SALPA oo Len: 165 Check: 4769 Weight: 0.100

Name: tr|Q9R4V0|Q9R4V0\_SALEN oo Len: 165 Check: 5980 Weight: 0.100

//

" 21-165<sup>1</sup> 0.8802

sp P12061 FM_SALEN	MRKSASAVAV LALIACGSAH/AAGFVGNKAV VQAAVTIAAQ NTTSANWSQD
tr Q5PM43 Q5PM43_SALPA	MRKSASAVAV LALIACGSAY AAGFVGNKAE VQAAVTIAAQ NTTSANWSQD
tr Q9R4V0 Q9R4V0_SALEN	..... .AGFVGNKAE VQAAVTIAAQ NTTSANWNQD

sp P12061 FM_SALEN	PGFTGPAVAA GQKVGTLISIT ATGPHNSVSI AGKGASVSGG VATVPFVDGQ
tr Q5PM43 Q5PM43_SALPA	PGFTGPAVAA GQKVGTLISIT ATGPHNSVSI AGKGASVSGG VATVPFVDGQ
tr Q9R4V0 Q9R4V0_SALEN	P.....

sp P12061 FM_SALEN	GQPVFRGRIQ GANINDQANT GIDGLAGWRV ASSQETLNVP VTTFGKSTLP
tr Q5PM43 Q5PM43_SALPA	GQPVFRGRIQ RANINDQVNT GIDGFAGWRV ASSQETLNVP VTTFGESTLP
tr Q9R4V0 Q9R4V0_SALEN	.....

sp P12061 FM_SALEN	AGTFTATFYV QQYQN
tr Q5PM43 Q5PM43_SALPA	AGAFTATFYV QQYQN
tr Q9R4V0 Q9R4V0_SALEN	.....

## CLUSTAL W (1.74) multiple sequence alignment

```

sp|P12061|FM_SALEN      MRKSASAVAVLALIACGSAHAAGFVGNKAVVQAAVTIAAQNTTSANWSQD
tr|Q5PM43|Q5PM43_SALPA MRKSASAVAVLALIACGSAYAAGFVGNKAEVQAAVTIAAQNTTSANWSQD
tr|Q9R4V0|Q9R4V0_SALEN -----AGFVGNKAEVQAAVTIAAQNTTSANWNQD
                        *****

```

```

sp|P12061|FM_SALEN      PGFTGPAVAAGQKVGTL SITATGPHNSVSIAGKGASVSGGVATVPFVDGQ
tr|Q5PM43|Q5PM43_SALPA PGFTGPAVAAGQKVGTL SITATGPHNSVSIAGKGASVSGGVATVPFVDGQ
tr|Q9R4V0|Q9R4V0_SALEN P-----
                        *

```

```

sp|P12061|FM_SALEN      GQPVFRGRIQGANINDQANTGIDGLAGWRVASSQETLNPVTTFGKSTLP
tr|Q5PM43|Q5PM43_SALPA GQPVFRGRIQGANINDQVNTGIDGFAGWRVASSQETLNPVTTFGESTLP
tr|Q9R4V0|Q9R4V0_SALEN -----

```

```

sp|P12061|FM_SALEN      AGTFTATFYVQQYQN
tr|Q5PM43|Q5PM43_SALPA AGAFTATFYVQQYQN
tr|Q9R4V0|Q9R4V0_SALEN -----

```

580 ID 2

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If your question is not covered, please contact [<helpdesk@expasy.org>](mailto:helpdesk@expasy.org).

NCBI BLAST program reference [PMID:9254694]:

Altschul S.F., Madden T.L., Schäffer A.A., Zhang J., Zhang Z., Miller W., Lipman D.J. Gapped BLAST and PSI-BLAST: a new generation of protein database search programs. Nucleic Acids Res. 25:3389-3402(1997).

Query: 128 AA (of which 14% low-complexity regions filtered out)

Date run: 2005-07-06 11:22:53 UTC+0100 on sib-gml.unil.ch

Program: NCBI BLASTP 1.5.4-Paracel [2003-06-05]

Database: EXPASY/UniProtKB

2,035,690 sequences; 659,769,346 total letters

UniProt Knowledgebase Release 5.4 consists of:

UniProtKB/Swiss-Prot Release 47.4 of 05-Jul-2005: 186882 entries

UniProtKB/TrEMBL Release 30.4 of 05-Jul-2005: 1837312 entries

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#### List of potentially matching sequences

Send selected sequences to

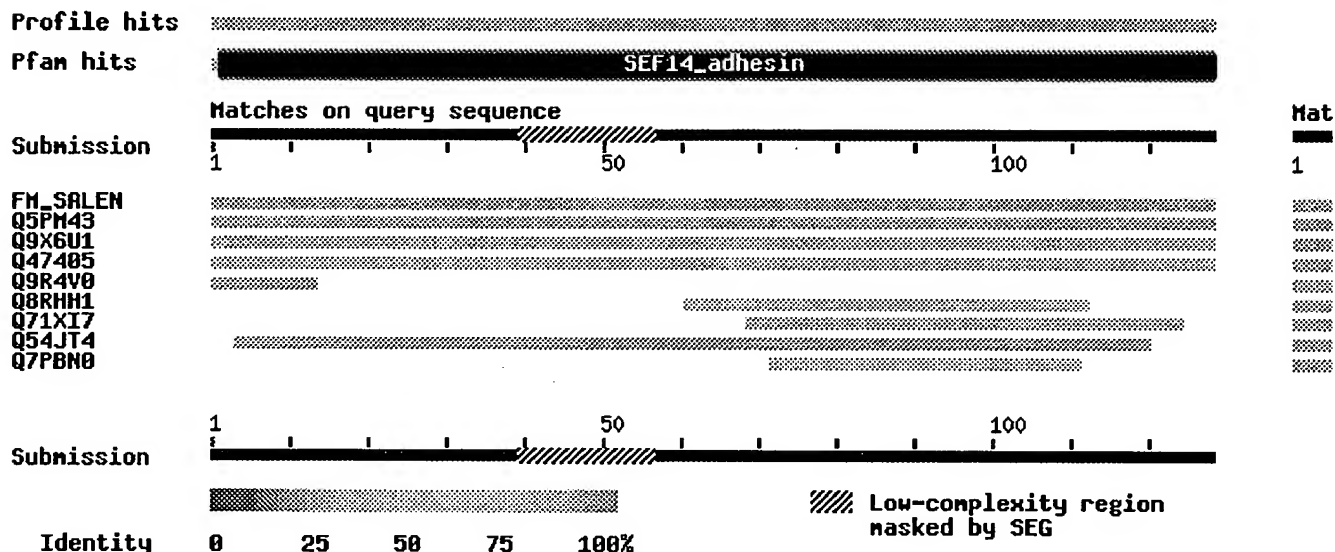
☐ Include query sequence

Db	AC	Description	Score	E-value
<input type="checkbox"/>	sp	<a href="#">F12061</a> FM_SALEN Fimbrial protein precursor [sefA] [Salmonella...]	224	4e-58
<input type="checkbox"/>	tr	<a href="#">Q5PM43</a> _SALPA Fimbrial structural protein [sefA] [Salmonella p...]	214	3e-55
<input type="checkbox"/>	tr	<a href="#">Q9X6U1</a> _ECOLI CS22 adhesin protein [cseA] [Escherichia coli]	93	9e-19
<input type="checkbox"/>	tr	<a href="#">Q47405</a> _ECOLI Antigen 8786 [nfaA] [Escherichia coli]	89	2e-17
<input type="checkbox"/>	tr	<a href="#">Q9R4V0</a> _SALEN Fimbrial protein SEF14 (Fragment) [Salmonella en...]	33	1.5
<input type="checkbox"/>	tr	<a href="#">Q8RHH1</a> _FUSNN Fusobacterium outer membrane protein family [FN2...]	31	5.7
<input type="checkbox"/>	tr	<a href="#">Q71XI7</a> _LISMF Cell wall surface anchor family protein [LMOF236...]	30	7.5
<input type="checkbox"/>	tr	<a href="#">Q54JT4</a> _DICDI Hypothetical protein [DDB0215928] [Dictyostelium...]	30	7.5
<input type="checkbox"/>	tr	<a href="#">Q7PBN0</a> _RICSI Hypothetical protein [rsib_orf.185] [Rickettsia ...]	30	9.8

## Graphical overview of the alignments

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## Alignments

sp [P12061](#) **Fimbrial protein precursor [sefA] [Salmonella enteritidis]** 165 AA  
FM\_SALEN

[align](#)

Score = 224 bits (570), Expect = 4e-58

Identities = 110/128 (85%), Positives = 110/128 (85%)

Query: 1 AAQNTTSANWSQDPGFTGPAVAAGQKVGTL SITATGPHNXXXXXXXXXXXXXXXXXXXXPFV 60  
AAQNTTSANWSQDPGFTGPAVAAGQKVGTL SITATGPHN PFV

Sbjct: 38 AAQNTTSANWSQDPGFTGPAVAAGQKVGTL SITATGPHNSVSIAGKGASVSGGVATVPFV 97

Query: 61 DGQGQPVFRGRIQGANINDQANTGIDGLAGWRVASSQETLNPVTTFGKSTLPAGTFTAT 120  
DGQGQPVFRGRIQGANINDQANTGIDGLAGWRVASSQETLNPVTTFGKSTLPAGTFTAT

Sbjct: 98 DGQGQPVFRGRIQGANINDQANTGIDGLAGWRVASSQETLNPVTTFGKSTLPAGTFTAT 157

Query: 121 FYVQQYQN 128  
FYVQQYQN

Sbjct: 158 FYVQQYQN 165

tr [Q5PM43](#) **Fimbrial structural protein [sefA] [Salmonella**  
Q5PM43\_SALPA **paratyphi-a]**

165

AA

[align](#)

Score = 214 bits (545), Expect = 3e-55

Identities = 105/128 (82%), Positives = 106/128 (82%)

Query: 1 AAQNTTSANWSQDPGFTGPAVAAGQKVGTL SITATGPHNXXXXXXXXXXXXXXXXXXXXPFV 60  
 AAQNTTSANWSQDPGFTGPAVAAGQKVGTL SITATGPHN PFV  
 Sbjct: 38 AAQNTTSANWSQDPGFTGPAVAAGQKVGTL SITATGPHNSVSIAGKGASVSGGVATVPFV 97

Query: 61 DGQGQPVFRGRIQGANINDQANTGIDGLAGWRVASSQETLNPVTTFGKSTLPAGTFTAT 120  
 DGQGQPVFRGRIQ ANINDQ NTGIDG AGWRVASSQETLNPVTTFG+STLPAG FTAT  
 Sbjct: 98 DGQGQPVFRGRIQRANINDQVNTGIDGFAGWRVASSQETLNPVTTFGESTLPAGAFTAT 157

Query: 121 FYVQQYQN 128  
 FYVQQYQN  
 Sbjct: 158 FYVQQYQN 165

tr Q9X6U1 CS22 adhesin protein [cseA] [Escherichia 166 AA  
 Q9X6U1\_ECOLI coli] align

Score = 93.2 bits (230), Expect = 9e-19  
 Identities = 52/131 (39%), Positives = 74/131 (55%), Gaps = 4/131 (3%)

Query: 1 AAQNTTSANWSQDPGFTGPAVAAGQKVGTL SITATGPHNXXXXXXXXXXXXXXXXXXXXPFV 60  
 +AQNT +A W+QDP +G +V A QK+GTL+I TG H PF  
 Sbjct: 37 SAQNTINATWTQDPSVSGSSVQAMQKLGLTNIQLTGSHAGVYVSGDGTGVSGGLVTIPFK 96

Query: 61 DGQGQPVFRGRIQGANINDQANTGIDGLA--GWRVASSQETLNPVTTFGKS-TLPAGTF 117  
 + GQ FRGR A+I +NT I G + GW + + +++ + F K+ +PAGT+  
 Sbjct: 97 NAAGQIPFRGR-TNADIGQASNTLIAGHSGPGWNLDPAGNNISLDIKAFQKNDNIPAGTY 155

Query: 118 TATFYVQQYQN 128  
 TATFY+QQYQ+  
 Sbjct: 156 TATFYIQYQS 166

tr Q47405 Antigen 8786 [nfaA] [Escherichia coli] 166 AA  
 Q47405\_ECOLI align

Score = 89.0 bits (219), Expect = 2e-17  
 Identities = 50/131 (38%), Positives = 70/131 (53%), Gaps = 4/131 (3%)

Query: 1 AAQNTTSANWSQDPGFTGPAVAAGQKVGTL SITATGPHNXXXXXXXXXXXXXXXXXXXXPFV 60  
 +AQNT +A W+QD +G +V A QK+GTL+I TG H PF  
 Sbjct: 37 SAQNTINATWTQDSSVSGSSVTAMQKLGLTNI RL TGSHAGVYVSGDDTGESGGLITIPFK 96

Query: 61 DGQGQPVFRGRIQGANINDQANTGIDGLA--GWRVASSQETLNPVTTF-GKSTLPAGTF 117  
 + GQ +FRGR A I T I G + GW + +Q+ N+ + F + +PAG +  
 Sbjct: 97 NTAGQVLFGRGR-TNAEIGQAMTTPIVGHSGPGWHLPGTQDNFNLDIRAFQNNIPAGEY 155

Query: 118 TATFYVQQYQN 128  
 TATFY+QQYQ+  
 Sbjct: 156 TATFYIQYQS 166

tr Q9R4V0 Fimbrial protein SEF14 (Fragment) [Salmonella 30 AA

• Q9R4V0\_SALEN enteritidis]

align

Score = 32.7 bits (73), Expect = 1.5  
Identities = 13/14 (92%), Positives = 14/14 (99%)

Query: 1 AAQNTTSANWSQDP 14  
AAQNTTSANW+QDP  
Sbjct: 17 AAQNTTSANWNQDP 30

tr Q8RHH1 Fusobacterium outer membrane protein family [FN2058] 1794  
Q8RHH1\_FUSNN [Fusobacterium  
nucleatum (subsp. nucleatum)] AA  
align

Score = 30.8 bits (68), Expect = 5.7  
Identities = 19/52 (36%), Positives = 26/52 (49%)

Query: 61 DGQGQPVFRGRIQGANINDQANTGIDGLAGWRVASSQETLNPVTTFGKSTL 112  
DGQG + G I N + +A I+G AG +TL+VP KST+  
Sbjct: 1227 DGQGTNLGAGNIDVQNGSAEATKNIEGTAGGDKRFGDKTSLVPGGGRTKSTI 1278

tr Q71XI7 Cell wall surface anchor family protein [LMOf2365\_2211] 1697  
Q71XI7\_LISMF [Listeria  
monocytogenes (serotype 4b / strain F2365)] AA  
align

Score = 30.4 bits (67), Expect = 7.5  
Identities = 17/57 (29%), Positives = 29/57 (50%), Gaps = 1/57 (1%)

Query: 69 RGRIQGANINDQANTGIDGLAGWRVASSQETLNPVTTFGKS-TLPAGTFTATFYVQ 124  
R ++ NI D+ +TG+ L + V + + +N + T GK +T+ A FY+Q  
Sbjct: 589 RIKMGNLNTDEFSTGVKALKSYTVRAYTDNINSVLLTEGKDYTIDKDVTPAGFYIQ 645

tr Q54JT4 Hypothetical protein [DDB0215928] [Dictyostelium 1929  
Q54JT4\_DICDI discoideum (Slime  
mold)] AA  
align

Score = 30.4 bits (67), Expect = 7.5  
Identities = 28/117 (23%), Positives = 41/117 (34%), Gaps = 17/117 (14%)

Query: 4 NTTSANWSQDPGFTGPAVAAGQKVGTL SITATGPHNXXXXXXXXXXXXXXXXXXXXPFVDGQ 63  
+TT + SQ G + A A+G + + S TAT +  
Sbjct: 323 STTITSGSQSTGASTTATASGSQSTSASTTATASGSQSTGASTATTSGGST----- 373

Query: 64 GQPVFRGRIQGANINDQANTGIDGLAGWRVASSQETLNPVTTFGKSTLPAGTFTAT 120  
G I GA+ + T G SQ + + TT G T +GH+T T  
Sbjct: 374 -----GFISGASTTSMSTTTATG--SIPTTGSQSTSGSYTTTGSQSTSGTYTTT 422

tr Q7PBN0 Hypothetical protein [rsib\_orf.185] [Rickettsia  
Q7PBN0\_RICSI sibirica]

149  
AA  
align

Score = 30.0 bits (66), Expect = 9.8  
Identities = 22/45 (48%), Positives = 27/45 (59%), Gaps = 12/45 (26%)

Query: 72 IQGANINDQANT-----GIDGLAGWRVASSQETLNVPVTTFGKST 111  
+Q ANIN Q+NT ID +ASSQE L+ TTFGKS+  
Sbjct: 89 VQQANINPQSNTVSRSSSIDSE----GIASSQEELS---TTFGKSS 126

Database: EXPASY/UniProtKB  
Posted date: Jul 4, 2005 6:23 AM  
Number of letters in database: 659,769,346  
Number of sequences in database: 2,035,690

Lambda	K	H
0.313	0.129	0.387

#### Gapped

Lambda	K	H
0.267	0.0410	0.140

Matrix: BLOSUM62  
Gap Penalties: Existence: 11, Extension: 1  
length of query: 128  
length of database: 659,769,346  
effective HSP length: 104  
effective length of query: 24  
effective length of database: 448,057,586  
effective search space: 10753382064  
effective search space used: 10753382064  
T: 11  
A: 40  
X1: 16 ( 7.2 bits)  
X2: 38 (14.6 bits)  
X3: 64 (24.7 bits)  
S1: 42 (21.9 bits)  
S2: 66 (30.0 bits)

Wallclock time: 2 seconds

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In case of problems, please read the [online BLAST help](#).  
If your question is not covered, please contact [<helpdesk@expasy.org>](mailto:helpdesk@expasy.org).

NCBI BLAST program reference [PMID:9254694]:

Altschul S.F., Madden T.L., Schäffer A.A., Zhang J., Zhang Z., Miller W., Lipman D.J. Gapped BLAST and PSI-BLAST: a new generation of protein database search programs. Nucleic Acids Res. 25:3389-3402(1997).

Query: 30 AA

Date run: 2005-07-06 11:07:32 UTC+0100 on sib-gml.unil.ch

Program: NCBI BLASTP 1.5.4-Paracel [2003-06-05]

Database: EXPASY/UniProtKB

2,035,690 sequences; 659,769,346 total letters

UniProt Knowledgebase Release 5.4 consists of:

UniProtKB/Swiss-Prot Release 47.4 of 05-Jul-2005: 186882 entries

UniProtKB/TrEMBL Release 30.4 of 05-Jul-2005: 1837312 entries

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[Printable view](#)

SEF14  
frag  
80302

#### List of potentially matching sequences

Send selected sequences to

☐ Include query sequence

Db	AC	Description	Score	E-value
<input type="checkbox"/>	tr Q9R4V0	_SALEN Fimbrial protein SEF14 (Fragment) [Salmonella en...	96	7e-20
<input type="checkbox"/>	tr Q5PM43	_SALPA Fimbrial structural protein [sefA] [Salmonella p...	93	7e-19
<input type="checkbox"/>	sp P12061	FM_SALEN Fimbrial protein precursor [sefA] [Salmonella...	87	4e-17
<input type="checkbox"/>	tr Q9X6U1	_ECOLI CS22 adhesin protein [cseA] [Escherichia coli]	43	8e-04
<input type="checkbox"/>	tr Q8PIT2	_XANAC ATP-dependent RNA helicase [deaD] [Xanthomonas a...	32	1.7
<input type="checkbox"/>	tr Q8P7G9	_XANCP ATP-dependent RNA helicase [deaD] [Xanthomonas c...	32	1.7
<input type="checkbox"/>	tr Q4UWN0	_XANCP ATP-dependent RNA helicase [XC_1475] [Xanthomona...	32	1.7
<input type="checkbox"/>	tr Q66BU1	_YERPS Flagellar basal-body rod protein FlgF [flgF] [Ye...	31	2.3
<input type="checkbox"/>	tr Q8ZFB4	_YERPE Flagellar basal-body rod protein FlgF (Cell-prox...	31	2.3

<input type="checkbox"/>	tr <a href="#">Q47405</a>	_ECOLI Antigen 8786 [nfaA] [Escherichia coli]	<a href="#">31</a>	2.3
<input type="checkbox"/>	tr <a href="#">Q7UNR7</a>	_RHOB Hypothetical protein [RB7418] [Rhodopirellula ba...]	<a href="#">30</a>	4.1
<input type="checkbox"/>	tr <a href="#">Q7XUK8</a>	_ORYSA OSJNBa0067K08.21 protein [OSJNBa0067K08.21] [Ory...]	<a href="#">29</a>	9.9

## Graphical overview of the alignments

[Click here](#) to resubmit your query after masking regions matching [PROSITE](#) profiles or [Pfam](#) HMMs  
 ( [Help](#) ) (use [ScanProsite](#) for more details about PROSITE matches)

## Profile hits

## Pfam hits

## Matches on query sequence

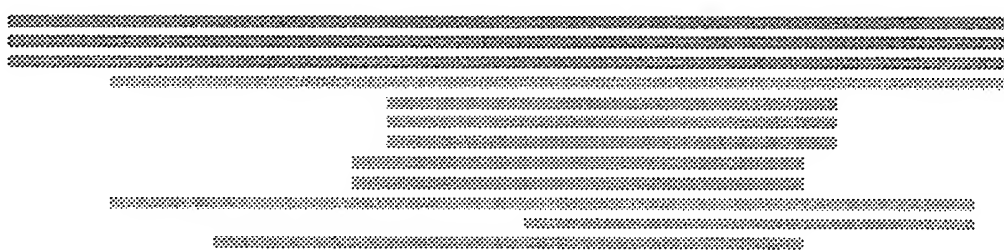
Mat

## Submission



1

Q9R4V0  
 Q5PM43  
 FM\_SALEN  
 Q9X6U1  
 Q8PIT2  
 Q8P7G9  
 Q4UUN0  
 Q66BU1  
 Q8ZFB4  
 Q47405  
 Q7UNR7  
 Q7XUK8



1  
 1  
 1  
 1  
 1  
 1  
 1  
 1  
 1  
 1  
 1  
 1  
 1

## Submission



Identity 0 25 50 75 100%

## Alignments

tr [Q9R4V0](#) Fimbrial protein SEF14 (Fragment) [Salmonella] 30 AA  
 Q9R4V0\_SALEN enteritidis]  
[align](#)

Score = 96.1 bits (219), Expect = 7e-20  
 Identities = 30/30 (100%), Positives = 30/30 (100%)

Query: 1 AGFVGNKAEVQAAVTIAAQNTTTSANWNQDP 30  
 AGFVGNKAEVQAAVTIAAQNTTTSANWNQDP  
 Sbjct: 1 AGFVGNKAEVQAAVTIAAQNTTTSANWNQDP 30

tr [Q5PM43](#) Fimbrial structural protein [sefA] [Salmonella] 165  
 Q5PM43\_SALPA paratyphi-a]  
[align](#)

Score = 92.7 bits (211), Expect = 7e-19  
 Identities = 29/30 (96%), Positives = 29/30 (96%)

Query: 1 AGFVGNKAEVQAAVTIAAQNTTSANWNQDP 30  
AGFVGNKAEVQAAVTIAAQNTTSANW QDP  
Sbjct: 22 AGFVGNKAEVQAAVTIAAQNTTSANWSQDP 51

sp P12061 Fimbrial protein precursor [sefA] [Salmonella enteritidis] 165 AA  
FM\_SALEN

align

Score = 86.7 bits (197), Expect = 4e-17  
Identities = 28/30 (93%), Positives = 28/30 (93%)

Query: 1 AGFVGNKAEVQAAVTIAAQNTTSANWNQDP 30  
AGFVGNKAEVQAAVTIAAQNTTSANW QDP  
Sbjct: 22 AGFVGNKAEVQAAVTIAAQNTTSANWSQDP 51

tr Q9X6U1 CS22 adhesin protein [cseA] [Escherichia coli] 166 AA  
Q9X6U1\_ECOLI

align

Score = 42.6 bits (93), Expect = 8e-04  
Identities = 16/27 (59%), Positives = 17/27 (62%)

Query: 4 VGNKAEVQAAVTIAAQNTTSANWNQDP 30  
VG+ A VQA V AQNT A W QDP  
Sbjct: 24 VGDVATVQAPVVFSAQNTINATWTQDP 50

tr Q8PIT2 ATP-dependent RNA helicase [deaD] [Xanthomonas 632  
Q8PIT2\_XANAC axonopodis (pv. citri)] AA  
align

Score = 31.6 bits (67), Expect = 1.7  
Identities = 11/14 (78%), Positives = 11/14 (78%)

Query: 12 AAVTIAAQNTTSAN 25  
A VTIAA TTSAN  
Sbjct: 209 AEVTIAAKTTTSAN 222

tr Q8P7G9 ATP-dependent RNA helicase [deaD] [Xanthomonas 642  
Q8P7G9\_XANCP campestris (pv. campestris)] AA  
align

Score = 31.6 bits (67), Expect = 1.7  
Identities = 11/14 (78%), Positives = 11/14 (78%)

Query: 12 AAVTIAAQNTTSAN 25  
A VTIAA TTSAN  
Sbjct: 209 AEVTIAAKTTTSAN 222

7/6/05

tr Q7UNR7 Hypothetical protein [RB7418] [Rhodopirellula baltica] 3507 AA  
Q7UNR7\_RHOBA

align

Score = 30.3 bits (64), Expect = 4.1

Identities = 10/14 (71%), Positives = 10/14 (71%), Gaps = 2/14 (14%)

Query: 16 IAAQNTT SANWNQD 29

IAAQNTT WN D

Sbjct: 3046 IAAQNTTT--WNAD 3057

tr Q7XUK8 OSJNBa0067K08.21 protein [OSJNBa0067K08.21] [Oryza 399  
Q7XUK8\_ORYSA sativa (japonica AA  
cultivar-group)] align

Score = 29.1 bits (61), Expect = 9.9

Identities = 12/28 (42%), Positives = 14/28 (49%), Gaps = 10/28 (35%)

Query: 7 KAEVQAAVT-----IAAQNTTSA 24

KAEV+AAV IAA+ T A

Sbjct: 138 KAEVHAAVSVAGVAAALAAIAESSTPA 165

Database: EXPASY/UniProtKB

Posted date: Jul 4, 2005 6:23 AM

Number of letters in database: 659,769,346

Number of sequences in database: 2,035,690

Lambda	K	H
0.344	0.271	1.62

Gapped

Lambda	K	H
0.294	0.110	0.610

Matrix: PAM30

Gap Penalties: Existence: 9, Extension: 1

length of query: 30

length of database: 659,769,346

effective HSP length: 21

effective length of query: 9

effective length of database: 617,019,856

effective search space: 5553178704

effective search space used: 5553178704

T: 16

A: 40

X1: 15 ( 7.4 bits)

X2: 35 (14.8 bits)

X3: 58 (24.6 bits)

S1: 40 (21.7 bits)

S2: 61 (29.1 bits)

Wallclock time: 134 seconds

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# UniProtKB/Swiss-Prot entry P12061

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[\[Features\]](#) [\[Sequence\]](#) [\[Tools\]](#)

*Note: most headings are clickable, even if they don't appear as links. They link to the user manual or other documents.*

## Entry information

Entry name	<b>FM_SALEN</b>
Primary accession number	<b>P12061</b>
Secondary accession numbers	None
Entered in Swiss-Prot in	Release 12, October 1989
Sequence was last modified in	Release 28, February 1994
Annotations were last modified in	Release 47, May 2005
Name and origin of the protein	
Protein name	<b>Fimbrial protein [Precursor]</b>
Synonyms	None
Gene name	<b>Name: sefA</b> Synonyms: sef14
From	Salmonella enteritidis [TaxID: 592]
Taxonomy	Bacteria; Proteobacteria; Gammaproteobacteria; Enterobacteriales; Enterobacteriaceae; Salmonella.

General  
Search  
note  
frag

## References

### [1] NUCLEOTIDE SEQUENCE.

**STRAIN=27655-3B;**

PubMed=8097515 [NCBI, ExPASy, EBI, Israel, Japan]

Clouthier S.C., Mueller K.-H., Doran J.L., Collinson S.K., Kay W.W.;

"Characterization of three fimbrial genes, sefABC, of Salmonella enteritidis.";

J. Bacteriol. 175:2523-2533(1993).

### [2] NUCLEOTIDE SEQUENCE.

PubMed=1701443 [NCBI, ExPASy, EBI, Israel, Japan]

Thorns C.J., Sojka M.G., Chasey D.C.;

"Detection of a novel fimbrial structure on the surface of Salmonella enteritidis by using a monoclonal antibody.";

J. Clin. Microbiol. 28:2409-2414(1990).

### [3] NUCLEOTIDE SEQUENCE.

Ogunniyi A.D., Kotlarski I., Morona R., Manning P.A.;

Submitted (JUN-1996) to the EMBL/GenBank/DDBJ databases.

### [4] PROTEIN SEQUENCE OF 22-85.

PubMed=2875990 [NCBI, ExPASy, EBI, Israel, Japan]

Feutrier J., Kay W.W., Trust T.J.;

"Purification and characterization of fimbriae from Salmonella enteritidis.";

J. Bacteriol. 168:221-227(1986).

**Comments**

- **FUNCTION:** Structural subunit of the sef14 fimbriae (S. enteritidis filamentous fimbriae).
- **SUBCELLULAR LOCATION:** Fimbria.

**Copyright**

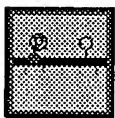
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**Cross-references**

EMBL	L11008; AAA27219.1; -;	[EMBL / GenBank / DDBJ]
	Genomic_DNA.	[CoDingSequence]
	L03833; AAA71892.1; -;	[EMBL / GenBank / DDBJ]
	Unassigned_DNA.	[CoDingSequence]
	X98516; CAA67141.1; -;	[EMBL / GenBank / DDBJ]
	Genomic_DNA.	[CoDingSequence]
PIR	A40618; A40618.	
PDB	1LUO; Model; A=1-165.[ExPASy / RCSB / EBI]	
InterPro	IPR010498; SEF14_adhesin.	
	Graphical view of domain structure.	
Pfam	PF06443; SEF14_adhesin; 1.	
	Pfam graphical view of domain structure.	
ProDom	[Domain structure / List of seq. sharing at least 1 domain]	
HOGONOM	[Family / Alignment / Tree]	
BLOCKS	P12061.	
ProtoNet	P12061.	
ProtoMap	P12061.	
PRESAGE	P12061.	
DIP	P12061.	
ModBase	P12061.	
SWISS-2DPAGE	Get region on 2D PAGE.	
UniRef	View cluster of proteins with at least 50% / 90% identity.	

**Keywords**

**3D-structure; Direct protein sequencing; Fimbria; Signal.**

**Features**

Feature table viewer

Key	From	To	Length	Description
SIGNAL	1	21	21	
CHAIN	22	165	144	Fimbrial protein.
CONFLICT	30	30		V -> E (in Ref. 2 and 3).
CONFLICT	84	85		GA -> QW (in Ref. 4).

**Sequence information**

Length: 165 AA [This is the length of the unprocessed precursor]  
 Molecular weight: 16477 Da [This is the MW of the unprocessed precursor]

CRC64: 5B33798A3F0F9091 [This is a checksum on the sequence]

10 20 30 40 50 60  
MRKSASAVAV LALIACGSAH AAGFVGNAK VQAAVTIAAQ NTTSANWSQD PGFTGPAVAA  
70 80 90 100 110 120  
GQKVGTL SIT ATGPHNSVSI AGKGASVSGG VATVPFVDGQ GQPVFRGRIQ GANINDQANT  
130 140 150 160  
GIDGLAGWRV ASSQETLNVP VTTFGKSTLP AGTFTATFYV QQYQN

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format

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*View entry in raw text format (no links)*

*Report form for errors/updates in this UniProtKB/Swiss-Prot entry*

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BLAST submission on  
ExPASy/SIB  
or at NCBI (USA)



Sequence analysis tools: ProtParam, ProtScale,  
Compute pI/Mw, PeptideMass, PeptideCutter,  
Dotlet (Java)



ScanProsite, MotifScan



Submit a homology modeling request to SWISS-  
MODEL



NPSA Sequence analysis  
tools




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In case of problems, please read the [online BLAST help](#).  
If your question is not covered, please contact [<helpdesk@expasy.org>](mailto:helpdesk@expasy.org).

NCBI BLAST program reference [PMID:9254694]:

Altschul S.F., Madden T.L., Schäffer A.A., Zhang J., Zhang Z., Miller W., Lipman D.J. Gapped BLAST and PSI-BLAST: a new generation of protein database search programs. Nucleic Acids Res. 25:3389-3402(1997).

=====

Query: 81 AA

Date run: 2005-07-06 11:55:34 UTC+0100 on sib-gml.unil.ch

Program: NCBI BLASTP 1.5.4-Paracel [2003-06-05]

Database: EXPASY/UniProtKB

2,035,690 sequences; 659,769,346 total letters

UniProt Knowledgebase Release 5.4 consists of:

UniProtKB/Swiss-Prot Release 47.4 of 05-Jul-2005: 186882 entries

UniProtKB/TrEMBL Release 30.4 of 05-Jul-2005: 1837312 entries

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#### List of potentially matching sequences

Send selected sequences to

☐ Include query sequence

Db AC	Description	Score	E-value
<input type="checkbox"/> sp <a href="#">Q06973</a>	FLIC_SALMO Flagellin (Phase-1-C flagellin) [fliC] [Sal...	189	6e-48
<input type="checkbox"/> sp <a href="#">Q06972</a>	FLIC_SALEN Flagellin (Phase-1-C flagellin) [fliC] [Sal...	189	6e-48
<input type="checkbox"/> tr <a href="#">Q53WZ9</a>	_SALEN Phase 1 flagellin [fliC] [Salmonella enteritidis]	189	6e-48
<input type="checkbox"/> tr <a href="#">Q6V2W5</a>	_9ENTR Phase 1 flagellin [fliC] [Salmonella enterica]	189	6e-48
<input type="checkbox"/> tr <a href="#">Q6V2V9</a>	_9ENTR Phase 1 flagellin [fliC] [Salmonella enterica]	189	6e-48
<input type="checkbox"/> tr <a href="#">Q66PR7</a>	_SALMO Phase 1 flagellin [fliC] [Salmonella montevideo]	189	6e-48
<input type="checkbox"/> tr <a href="#">Q6LDG7</a>	_SALGL Phase-1 flagellin [fliC1] [Salmonella gallinarum]	189	6e-48
<input type="checkbox"/> tr <a href="#">Q6LDG6</a>	_SALET Phase-1 flagellin [fliC1] [Salmonella enterica s...	189	6e-48
<input type="checkbox"/> tr <a href="#">Q66PR6</a>	_SALET Phase 1 flagellin [fliC] [Salmonella enterica su...	189	6e-48

<input type="checkbox"/>	tr	<u>Q66PN4</u>	_SALET Phase 1 flagellin [fliC] [Salmonella enterica su...	<u>189</u>	6e-48
<input type="checkbox"/>	tr	<u>Q66PN3</u>	_SALET Phase 1 flagellin [fliC] [Salmonella enterica su...	<u>189</u>	6e-48
<input type="checkbox"/>	tr	<u>Q54210</u>	_SALGL Phase-1 flagellin [fliC1] [Salmonella gallinarum]	<u>189</u>	6e-48
<input type="checkbox"/>	tr	<u>Q53998</u>	_SALEN Phase-1 flagellin (Fragment) [fliC] [Salmonella ...]	<u>189</u>	6e-48
<input type="checkbox"/>	tr	<u>Q54864</u>	_SALPU Phase-1 flagellin [fliC] [Salmonella pullorum]	<u>187</u>	3e-47
<input type="checkbox"/>	tr	<u>Q54863</u>	_SALPU Phase-1 flagellin [fliC] [Salmonella pullorum]	<u>187</u>	3e-47
<input type="checkbox"/>	tr	<u>Q54329</u>	_SALET Phase-1 flagellin (Fragment) [fliC] [Salmonella ...]	<u>187</u>	3e-47
<input type="checkbox"/>	tr	<u>Q53989</u>	_SALET Phase-1 flagellin (Fragment) [fliC] [Salmonella ...]	<u>187</u>	3e-47
<input type="checkbox"/>	tr	<u>Q53970</u>	_SALDU Phase-1 flagellin [fliC1] [Salmonella dublin]	<u>187</u>	3e-47
<input type="checkbox"/>	tr	<u>Q53967</u>	_SALET Phase-1 flagellin (Fragment) [fliC] [Salmonella ...]	<u>187</u>	3e-47
<input type="checkbox"/>	tr	<u>Q53822</u>	_SALET Phase-1 flagellin (Fragment) [fliC] [Salmonella ...]	<u>187</u>	3e-47
<input type="checkbox"/>	tr	<u>Q6V2W1</u>	_9ENTR Phase 1 flagellin [fliC] [Salmonella enterica]	<u>187</u>	3e-47
<input type="checkbox"/>	tr	<u>Q79DB7</u>	_SALET Phase 1 flagellin [fliC] [Salmonella enterica su...	<u>186</u>	5e-47
<input type="checkbox"/>	tr	<u>Q57381</u>	_SALEN Phase-1 flagellin [fliC1] [Salmonella enteritidis]	<u>186</u>	5e-47
<input type="checkbox"/>	tr	<u>Q6V2U9</u>	_9ENTR Phase 1 flagellin [fliC] [Salmonella enterica]	<u>186</u>	6e-47
<input type="checkbox"/>	tr	<u>Q53993</u>	_9ENTR Phase 1 flagellin [fliC] [Salmonella enterica]	<u>185</u>	8e-47
<input type="checkbox"/>	sp	<u>Q06971</u>	FLIC_SALDU Flagellin (Phase-1-C flagellin) [fliC] [Sal...	<u>184</u>	2e-46
<input type="checkbox"/>	tr	<u>Q6V2V3</u>	_9ENTR Phase 1 flagellin [fliC] [Salmonella enterica]	<u>184</u>	2e-46
<input type="checkbox"/>	tr	<u>Q66PR3</u>	_SALDU Phase 1 flagellin [fliC] [Salmonella dublin]	<u>184</u>	2e-46
<input type="checkbox"/>	tr	<u>Q6V2V2</u>	_9ENTR Phase 1 flagellin [fliC] [Salmonella enterica]	<u>184</u>	2e-46
<input type="checkbox"/>	tr	<u>Q66PR5</u>	_SALNA Phase 1 flagellin [fliC] [Salmonella naestved]	<u>184</u>	2e-46
<input type="checkbox"/>	sp	<u>Q06981</u>	FLIC_SALMC Flagellin (Phase-1-D flagellin) [fliC] [Sal...	<u>184</u>	3e-46
<input type="checkbox"/>	tr	<u>Q66PR2</u>	_SALMC Phase 1 flagellin [fliC] [Salmonella moscow]	<u>184</u>	3e-46
<input type="checkbox"/>	tr	<u>Q6V2V0</u>	_9ENTR Phase 1 flagellin [fliC] [Salmonella enterica]	<u>184</u>	3e-46
<input type="checkbox"/>	sp	<u>Q06982</u>	FLIC_SALRO Flagellin (Phase-1-C flagellin) [fliC] [Sal...	<u>182</u>	7e-46
<input type="checkbox"/>	tr	<u>Q66PR4</u>	_SALRO Phase 1 flagellin [fliC] [Salmonella rostock]	<u>182</u>	7e-46
<input type="checkbox"/>	tr	<u>Q6V2V1</u>	_9ENTR Phase 1 flagellin [fliC] [Salmonella enterica]	<u>182</u>	7e-46
<input type="checkbox"/>	sp	<u>Q52959</u>	FLIC_SALNA Phase-1 flagellin [fliC] [Salmonella naestved]	<u>182</u>	9e-46
<input type="checkbox"/>	tr	<u>Q6V2V5</u>	_9ENTR Phase 1 flagellin [fliC] [Salmonella enterica]	<u>182</u>	9e-46
<input type="checkbox"/>	sp	<u>Q06968</u>	FLIC_SALBE Flagellin (Phase-1-I flagellin) [fliC] [Sal...	<u>176</u>	4e-44
<input type="checkbox"/>	tr	<u>Q6V2H1</u>	_9ENTR Phase 1 flagellin [fliC] [Salmonella enterica]	<u>176</u>	4e-44
<input type="checkbox"/>	tr	<u>Q53583</u>	_SALET Phase-1 flagellin (Fragment) [fliC] [Salmonella ...]	<u>176</u>	4e-44
<input type="checkbox"/>	sp	<u>Q06970</u>	FLIC_SALDE Flagellin (Phase-1-C flagellin) [fliC] [Sal...	<u>175</u>	8e-44
<input type="checkbox"/>	tr	<u>Q6V2X1</u>	_9ENTR Phase 1 flagellin [fliC] [Salmonella enterica]	<u>175</u>	8e-44
<input type="checkbox"/>	tr	<u>Q66PR8</u>	_SALDE Phase 1 flagellin [fliC] [Salmonella derby]	<u>175</u>	8e-44
<input type="checkbox"/>	tr	<u>Q6V2W8</u>	_9ENTR Phase 1 flagellin [fliC] [Salmonella enterica]	<u>175</u>	8e-44
<input type="checkbox"/>	tr	<u>Q66PS0</u>	_SALET Phase 1 flagellin [fliC] [Salmonella enterica su...	<u>175</u>	8e-44
<input type="checkbox"/>	tr	<u>Q6V2G9</u>	_9ENTR Phase 1 flagellin [fliC] [Salmonella enterica]	<u>174</u>	2e-43
<input type="checkbox"/>	tr	<u>Q66PR9</u>	_9ENTR Phase 1 flagellin [fliC] [Salmonella enterica su...	<u>174</u>	2e-43
<input type="checkbox"/>	tr	<u>Q53990</u>	_9ENTR Phase 1 flagellin [fliC] [Salmonella enterica]	<u>174</u>	2e-43
<input type="checkbox"/>	tr	<u>Q53992</u>	_9ENTR Phase 1 flagellin [fliC] [Salmonella enterica]	<u>173</u>	4e-43
<input type="checkbox"/>	tr	<u>Q53991</u>	_9ENTR Phase 1 flagellin [fliC] [Salmonella enterica]	<u>173</u>	5e-43
<input type="checkbox"/>	tr	<u>Q66PQ9</u>	_9ENTR Phase 1 flagellin [fliC] [Salmonella enterica su...	<u>173</u>	5e-43
<input type="checkbox"/>	tr	<u>Q66PQ8</u>	_SALEE Phase 1 flagellin [fliC] [Salmonella enterica VI...	<u>173</u>	5e-43
<input type="checkbox"/>	tr	<u>Q53996</u>	_9ENTR Phase 1 flagellin [fliC] [Salmonella enterica]	<u>173</u>	5e-43


<input type="checkbox"/>	tr	<a href="#">Q54489</a>	_SALET Phase 1 flagellin [fliC] [Salmonella enterica su...	<a href="#">172</a>	7e-43
<input type="checkbox"/>	tr	<a href="#">Q6V2U0</a>	_9ENTR Phase 1 flagellin [fliC] [Salmonella enterica]	<a href="#">172</a>	7e-43
<input type="checkbox"/>	tr	<a href="#">Q66PR1</a>	_SALSE Phase 1 flagellin [fliC] [Salmonella senftenberg]	<a href="#">171</a>	2e-42
<input type="checkbox"/>	tr	<a href="#">Q54414</a>	_SALET Phase-1 flagellin (Fragment) [fliC] [Salmonella ...]	<a href="#">170</a>	3e-42
<input type="checkbox"/>	sp	<a href="#">Q06983</a>	FLIC_SALSE Flagellin (Phase-1-C flagellin) [fliC] [Sal...	<a href="#">169</a>	7e-42
<input type="checkbox"/>	sp	<a href="#">Q06969</a>	FLIC_SALBU Flagellin (Phase-1-C flagellin) [fliC] [Sal...	<a href="#">169</a>	7e-42
<input type="checkbox"/>	tr	<a href="#">Q66PR0</a>	_SALBU Phase 1 flagellin [fliC] [Salmonella budapest]	<a href="#">169</a>	7e-42
<input type="checkbox"/>	tr	<a href="#">Q6V2X0</a>	_9ENTR Phase 1 flagellin [fliC] [Salmonella enterica]	<a href="#">169</a>	7e-42
<input type="checkbox"/>	tr	<a href="#">Q6V2U7</a>	_9ENTR Phase 1 flagellin [fliC] [Salmonella enterica]	<a href="#">169</a>	7e-42
<input type="checkbox"/>	tr	<a href="#">Q6V2U6</a>	_9ENTR Phase 1 flagellin [fliC] [Salmonella enterica]	<a href="#">169</a>	7e-42
<input type="checkbox"/>	tr	<a href="#">Q6LD27</a>	_SALET Phase-1 flagellin (Fragment) [fliC] [Salmonella ...]	<a href="#">169</a>	7e-42
<input type="checkbox"/>	tr	<a href="#">Q6V2V7</a>	_9ENTR Phase 1 flagellin [fliC] [Salmonella enterica]	<a href="#">166</a>	8e-41
<input type="checkbox"/>	tr	<a href="#">Q53995</a>	_9ENTR Phase 1 flagellin [fliC] [Salmonella enterica]	<a href="#">164</a>	3e-40
<input type="checkbox"/>	tr	<a href="#">Q53994</a>	_9ENTR Phase 1 flagellin [fliC] [Salmonella enterica]	<a href="#">163</a>	3e-40
<input type="checkbox"/>	tr	<a href="#">Q6V2G8</a>	_9ENTR Phase 1 flagellin [fliC] [Salmonella enterica]	<a href="#">162</a>	9e-40
<input type="checkbox"/>	tr	<a href="#">Q6V2T7</a>	_9ENTR Phase 1 flagellin [fliC] [Salmonella enterica]	<a href="#">162</a>	1e-39
<input type="checkbox"/>	tr	<a href="#">Q6V2G7</a>	_9ENTR Phase 1 flagellin [fliC] [Salmonella enterica]	<a href="#">160</a>	4e-39
<input type="checkbox"/>	sp	<a href="#">Q06974</a>	FLIC_SALON Flagellin (Phase-1-C flagellin) [fliC] [Sal...	<a href="#">156</a>	8e-38
<input type="checkbox"/>	tr	<a href="#">Q6V2U1</a>	_9ENTR Phase 1 flagellin [fliC] [Salmonella enterica]	<a href="#">156</a>	8e-38
<input type="checkbox"/>	tr	<a href="#">Q6LD24</a>	_SALET Phase 1 flagellin [fliC] [Salmonella enterica su...	<a href="#">156</a>	8e-38
<input type="checkbox"/>	tr	<a href="#">Q54415</a>	_SALET Phase-1 flagellin (Fragment) [fliC] [Salmonella ...]	<a href="#">156</a>	8e-38
<input type="checkbox"/>	tr	<a href="#">Q53821</a>	_SALET Phase-1 flagellin (Fragment) [fliC] [Salmonella ...]	<a href="#">156</a>	8e-38
<input type="checkbox"/>	tr	<a href="#">Q6V2U4</a>	_9ENTR Phase 1 flagellin [fliC] [Salmonella enterica]	<a href="#">154</a>	2e-37
<input type="checkbox"/>	tr	<a href="#">Q6V2U3</a>	_9ENTR Phase 1 flagellin [fliC] [Salmonella enterica]	<a href="#">154</a>	2e-37
<input type="checkbox"/>	tr	<a href="#">Q54515</a>	_SALET Phase 1 flagellin [fliC] [Salmonella enterica su...	<a href="#">150</a>	4e-36
<input type="checkbox"/>	tr	<a href="#">Q9R2V0</a>	_SALPU Phase 1 flagellin C (Fragment) [fliC] [Salmonell...	<a href="#">117</a>	3e-26
<input type="checkbox"/>	tr	<a href="#">Q5G1R0</a>	_SALGL FliC (Fragment) [fliC] [Salmonella gallinarum]	<a href="#">116</a>	5e-26
<input type="checkbox"/>	tr	<a href="#">Q5G1Q9</a>	_SALPU FliC (Fragment) [fliC] [Salmonella pullorum]	<a href="#">106</a>	5e-23
<input type="checkbox"/>	tr	<a href="#">Q9R405</a>	_SALGL Phase 1 flagellin C (Fragment) [fliC] [Salmonell...	<a href="#">103</a>	5e-22
<input type="checkbox"/>	tr	<a href="#">Q9R406</a>	_SALPU Phase 1 flagellin C (Fragment) [fliC] [Salmonell...	<a href="#">101</a>	2e-21
<input type="checkbox"/>	tr	<a href="#">Q5G1Q8</a>	_SALGL FliC (Fragment) [fliC] [Salmonella gallinarum]	<a href="#">99</a>	1e-20
<input type="checkbox"/>	tr	<a href="#">Q8GGH8</a>	_ECOLI Flagellin (Fragment) [fliC] [Escherichia coli]	<a href="#">48</a>	3e-05
<input type="checkbox"/>	tr	<a href="#">Q5ECK7</a>	_ECOLI FliC (Fragment) [fliC] [Escherichia coli]	<a href="#">45</a>	2e-04
<input type="checkbox"/>	tr	<a href="#">Q52R20</a>	_ECOLI FliC (Fragment) [fliC] [Escherichia coli]	<a href="#">45</a>	2e-04
<input type="checkbox"/>	tr	<a href="#">Q842D4</a>	_ECOLI FliC (Fragment) [Escherichia coli]	<a href="#">45</a>	2e-04
<input type="checkbox"/>	tr	<a href="#">Q5ECJ1</a>	_ECOLI FliC (Fragment) [fliC] [Escherichia coli]	<a href="#">45</a>	2e-04
<input type="checkbox"/>	tr	<a href="#">Q5ECI9</a>	_ECOLI FliC (Fragment) [fliC] [Escherichia coli]	<a href="#">45</a>	2e-04
<input type="checkbox"/>	tr	<a href="#">Q9R3Q8</a>	_ECOLI Flagellin (Fragment) [fliC] [Escherichia coli]	<a href="#">45</a>	2e-04
<input type="checkbox"/>	tr	<a href="#">Q8GGI1</a>	_ECOLI Flagellin (Fragment) [fliC] [Escherichia coli]	<a href="#">45</a>	2e-04
<input type="checkbox"/>	tr	<a href="#">Q76DK5</a>	_SALET Phase II flagellin [fljB] [Salmonella enterica s...	<a href="#">45</a>	2e-04
<input type="checkbox"/>	tr	<a href="#">Q6VMV6</a>	_ECOLI Flagellin [fliC] [Escherichia coli]	<a href="#">45</a>	2e-04
<input type="checkbox"/>	tr	<a href="#">Q6VMU9</a>	_ECOLI Flagellin [fliC] [Escherichia coli]	<a href="#">45</a>	2e-04
<input type="checkbox"/>	tr	<a href="#">Q5ZPZ4</a>	_ECOLI Flagellin C (Fragment) [fliC] [Escherichia coli]	<a href="#">45</a>	2e-04
<input type="checkbox"/>	tr	<a href="#">Q8GGI2</a>	_ECOLI Flagellin (Fragment) [fliC] [Escherichia coli]	<a href="#">45</a>	2e-04
<input type="checkbox"/>	tr	<a href="#">Q842C3</a>	_ECOLI FliC (Fragment) [Escherichia coli]	<a href="#">44</a>	6e-04

☐ tr Q93ES4 \_ECOLI Flagellin [Escherichia coli]

44 6e-04

**Graphical overview of the alignments**

[Click here](#) to resubmit your query after masking regions matching PROSITE profiles or Pfam HMMs

( [Help](#)) (use [ScanProsite](#) for more details about PROSITE matches)

**Profile hits**   
**Pfam hits** 

Submission	Matches on query sequence		Mat
	1	50	
FLIC_SALMO			
FLIC_SALEN			
Q53M29			
Q6V2M5			
Q6V2V9			
Q66PR7			
Q6LDG7			
Q6LDG6			
Q66PR6			
Q66PN4			
Q66PN3			
Q54210			
Q53998			
Q54864			
Q54863			
Q54329			
Q53989			
Q53970			
Q53967			
Q53822			
Q6V2H1			
Q790B7			
Q57381			
Q6V2U9			
Q53993			
FLIC_SALDU			
Q6V2V3			
Q66PR3			
Q6V2V2			
Q66PR5			
FLIC_SALMC			
Q66PR2			
Q6V2V0			
FLIC_SALRO			
Q66PR4			
Q6V2V1			
FLIC_SALNA			
Q6V2V5			
FLIC_SALBE			
Q6V2H1			
Q53583			
FLIC_SALDE			
Q6V2X1			
Q66PR8			
Q6V2H8			
Q66PS0			
Q6V2G9			
Q66PR9			
Q53990			
Q53992			
Q53991			
Q66PQ9			
Q66PQ8			
Q53996			
Q54489			
Q6V2U0			
Q66PR1			
Q54414			
FLIC_SALSE			
FLIC_SALBU			
Q66PR0			
Q6V2X0			
Q6V2U7			
Q6V2U6			
Q6LD27			
Q6V2V7			
Q53995			
Q53994			
Q6V2G8			
Q6V2T7			
Q6V2G7			
FLIC_SALON			
Q6V2U1			
Q6LD24			
Q54415			
Q53821			
Q6V2U4			
Q6V2U3			
Q54515			
Q9R2V0			
Q5G1R0			
Q5G1Q9			
Q9R405			
Q9R406			
Q5G1Q8			
Q8GCH0			

```

sp   Q06973      Flagellin (Phase-1-C flagellin) [fliC] [Salmonella      504
      FLIC_SALMO montevideo]
                                     AA
                                     align

```

Query: 1 KEGDTFDYKGVTFITIDTKTGDDGNGKVSSTINGEKVTLTVADIATGATDVNAATLQSSKN 60  
KEGDTFDYKGVTFITIDTKTGDDGNGKVSSTINGEKVTLTVADIATGATDVNAATLQSSKN  
Sbjct: 270 KEGDTFDYKGVTFITIDTKTGDDGNGKVSSTINGEKVTLTVADIATGATDVNAATLQSSKN 329

Query: 61 VYTSVVNGQFTFDDKTKNESA 81  
VYTSVVNGQFTFDDKTKNESA  
Sbjct: 330 VYTSVVNGQFTFDDKTKNESA 350

```
sp Q06972 Flagellin (Phase-1-C flagellin) [fliC] [Salmonella enteritidis]
```

504  
AA  
align

Score = 189 bits (431), Expect = 6e-48  
Identities = 81/81 (100%), Positives = 81/81 (100%)

Query: 1 KEGDTFDYKGVTFITIDTKTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQSSKN 60  
KEGDTFDYKGVTFITIDTKTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQSSKN  
Subject: 270 KEGDTFDYKGVTFITIDTKTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQSSKN 329

Query: 61 VYTSVVNGQFTFDDKTKNESA 81  
VYTSVVNGQFTFDDKTKNESA  
Sbjct: 330 VYTSVVNGQFTFDDKTKNESA 350

```
tr      Q53WZ9          Phase 1 flagellin [fliC] [Salmonella      505 AA
        Q53WZ9 SALEN enteritidis] align
```

Score = 189 bits (431), Expect = 6e-48  
Identities = 81/81 (100%), Positives = 81/81 (100%)

Query: 1 KEGDTFDYKGVTFETIDTKTGDDGNGKVSSTINGEKVTLTVADIATGATDVNAATLQSSKN 60  
KEGDTFDYKGVTFETIDTKTGDDGNGKVSSTINGEKVTLTVADIATGATDVNAATLQSSKN  
Sbjct: 271 KEGDTFDYKGVTFETIDTKTGDDGNGKVSSTINGEKVTLTVADIATGATDVNAATLQSSKN 330

Query: 61 VYTSVVNGQFTFDDKTKNESA 81  
VYTSVVNGQFTFDDKTKNESA  
Sbjct: 331 VYTSVVNGQFTFDDKTKNESA 351

tr	<u>Q6V2W5</u>	Phase 1 flagellin [fliC] [Salmonella	505 AA
	Q6V2W5 9ENTR	enterica]	align

Score = 189 bits (431), Expect = 6e-48  
Identities = 81/81 (100%), Positives = 81/81 (100%)

Query: 1 KEGDTFDYKGVTFITIDTKTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQSSKN 60  
KEGDTFDYKGVTFITIDTKTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQSSKN  
Sbjct: 271 KEGDTFDYKGVTFITIDTKTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQSSKN 330

Query: 61 VYTSVVNGQFTFDDKTKNESA 81  
VYTSVVNGQFTFDDKTKNESA  
Sbjct: 331 VYTSVVNGQFTFDDKTKNESA 351

tr Q6V2V9 Phase 1 flagellin [fliC] [Salmonella] 505 AA  
Q6V2V9\_9ENTR enterica align

Score = 189 bits (431), Expect = 6e-48  
Identities = 81/81 (100%), Positives = 81/81 (100%)

Query: 1 KEGDTFDYKGVTFITIDTKTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQSSKN 60  
KEGDTFDYKGVTFITIDTKTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQSSKN  
Sbjct: 271 KEGDTFDYKGVTFITIDTKTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQSSKN 330

Query: 61 VYTSVVNGQFTFDDKTKNESA 81  
VYTSVVNGQFTFDDKTKNESA  
Sbjct: 331 VYTSVVNGQFTFDDKTKNESA 351

tr Q66PR7 Phase 1 flagellin [fliC] [Salmonella] 505 AA  
Q66PR7\_SALMO monteideo align

Score = 189 bits (431), Expect = 6e-48  
Identities = 81/81 (100%), Positives = 81/81 (100%)

Query: 1 KEGDTFDYKGVTFITIDTKTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQSSKN 60  
KEGDTFDYKGVTFITIDTKTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQSSKN  
Sbjct: 271 KEGDTFDYKGVTFITIDTKTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQSSKN 330

Query: 61 VYTSVVNGQFTFDDKTKNESA 81  
VYTSVVNGQFTFDDKTKNESA  
Sbjct: 331 VYTSVVNGQFTFDDKTKNESA 351

tr Q6LDG7 Phase-1 flagellin [fliC1] [Salmonella] 505 AA  
Q6LDG7\_SALGL gallinarum align

Score = 189 bits (431), Expect = 6e-48  
Identities = 81/81 (100%), Positives = 81/81 (100%)

Query: 1 KEGDTFDYKGVTFITIDTKTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQSSKN 60  
KEGDTFDYKGVTFITIDTKTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQSSKN  
Sbjct: 271 KEGDTFDYKGVTFITIDTKTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQSSKN 330

Query: 61 VYTSVVNGQFTFDDKTKNESA 81

VYTSVVNGQFTFDDKTKNESA  
Sbjct: 331 VYTSVVNGQFTFDDKTKNESA 351

tr Q6LDG6 Phase-1 flagellin [fliC] [Salmonella enterica subsp. 505  
Q6LDG6\_SALET enterica AA  
serovar Gallinarum/pullorum] align

Score = 189 bits (431), Expect = 6e-48  
Identities = 81/81 (100%), Positives = 81/81 (100%)

Query: 1 KEGDTFDYKGVTFITIDTKTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQSSKN 60  
KEGDTFDYKGVTFITIDTKTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQSSKN  
Sbjct: 271 KEGDTFDYKGVTFITIDTKTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQSSKN 330

Query: 61 VYTSVVNGQFTFDDKTKNESA 81  
VYTSVVNGQFTFDDKTKNESA  
Sbjct: 331 VYTSVVNGQFTFDDKTKNESA 351

tr Q66PR6 Phase 1 flagellin [fliC] [Salmonella enterica subsp. 505  
Q66PR6\_SALET enterica AA  
serovar Enteritidis] align

Score = 189 bits (431), Expect = 6e-48  
Identities = 81/81 (100%), Positives = 81/81 (100%)

Query: 1 KEGDTFDYKGVTFITIDTKTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQSSKN 60  
KEGDTFDYKGVTFITIDTKTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQSSKN  
Sbjct: 271 KEGDTFDYKGVTFITIDTKTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQSSKN 330

Query: 61 VYTSVVNGQFTFDDKTKNESA 81  
VYTSVVNGQFTFDDKTKNESA  
Sbjct: 331 VYTSVVNGQFTFDDKTKNESA 351

tr Q66PN4 Phase 1 flagellin [fliC] [Salmonella enterica subsp. 505  
Q66PN4\_SALET enterica AA  
serovar Emek] align

Score = 189 bits (431), Expect = 6e-48  
Identities = 81/81 (100%), Positives = 81/81 (100%)

Query: 1 KEGDTFDYKGVTFITIDTKTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQSSKN 60  
KEGDTFDYKGVTFITIDTKTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQSSKN  
Sbjct: 271 KEGDTFDYKGVTFITIDTKTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQSSKN 330

Query: 61 VYTSVVNGQFTFDDKTKNESA 81  
VYTSVVNGQFTFDDKTKNESA  
Sbjct: 331 VYTSVVNGQFTFDDKTKNESA 351

tr Q66PN3 Phase 1 flagellin [fliC] [Salmonella enterica subsp. 505  
Q66PN3\_SALET enterica AA  
serovar Enteritidis] align

Score = 189 bits (431), Expect = 6e-48  
Identities = 81/81 (100%), Positives = 81/81 (100%)

Query: 1 KEGDTFDYKGVFTFTIDTKTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQSSKN 60  
KEGDTFDYKGVFTFTIDTKTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQSSKN  
Sbjct: 271 KEGDTFDYKGVFTFTIDTKTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQSSKN 330

Query: 61 VYTSVVNGQFTFDDKTKNESA 81  
VYTSVVNGQFTFDDKTKNESA  
Sbjct: 331 VYTSVVNGQFTFDDKTKNESA 351

tr Q54210 Phase-1 flagellin [fliC1] [Salmonella 494 AA  
Q54210\_SALGL gallinarum] align

Score = 189 bits (431), Expect = 6e-48  
Identities = 81/81 (100%), Positives = 81/81 (100%)

Query: 1 KEGDTFDYKGVFTFTIDTKTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQSSKN 60  
KEGDTFDYKGVFTFTIDTKTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQSSKN  
Sbjct: 271 KEGDTFDYKGVFTFTIDTKTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQSSKN 330

Query: 61 VYTSVVNGQFTFDDKTKNESA 81  
VYTSVVNGQFTFDDKTKNESA  
Sbjct: 331 VYTSVVNGQFTFDDKTKNESA 351

tr Q53998 Phase-1 flagellin (Fragment) [fliC] [Salmonella 493  
Q53998\_SALEN enteritidis] AA  
align

Score = 189 bits (431), Expect = 6e-48  
Identities = 81/81 (100%), Positives = 81/81 (100%)

Query: 1 KEGDTFDYKGVFTFTIDTKTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQSSKN 60  
KEGDTFDYKGVFTFTIDTKTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQSSKN  
Sbjct: 259 KEGDTFDYKGVFTFTIDTKTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQSSKN 318

Query: 61 VYTSVVNGQFTFDDKTKNESA 81  
VYTSVVNGQFTFDDKTKNESA  
Sbjct: 319 VYTSVVNGQFTFDDKTKNESA 339

tr Q54864 Phase-1 flagellin [fliC] [Salmonella 505 AA  
Q54864\_SALPU pullorum] align

Score = 187 bits (426), Expect = 3e-47  
Identities = 80/81 (98%), Positives = 81/81 (99%)

Query: 1 KEGDTFDYKGVFTFTIDTKTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQSSKN 60  
KEGDTFDYKGVFTFTIDTKTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQSSKN  
Sbjct: 271 KEGDTFDYKGVFTFTIDTKTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQSSKN 330

Query: 61 VYTSVVNGQFTFDDDKTKNESA 81  
VYTSVVNG+FTFDDDKTKNESA  
Sbjct: 331 VYTSVVNGKFTFDDDKTKNESA 351

tr Q54863 Phase-1 flagellin [fliC] [Salmonella 505 AA  
Q54863\_SALPU pullorum] align

Score = 187 bits (426), Expect = 3e-47  
Identities = 80/81 (98%), Positives = 81/81 (99%)

Query: 1 KEGDTFDYKGVFTFTIDTKTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQSSKN 60  
KEGDTFDYKGVFTFTIDTKTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQSSKN  
Sbjct: 271 KEGDTFDYKGVFTFTIDTKTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQSSKN 330

Query: 61 VYTSVVNGQFTFDDDKTKNESA 81  
VYTSVVNG+FTFDDDKTKNESA  
Sbjct: 331 VYTSVVNGKFTFDDDKTKNESA 351

tr Q54329 Phase-1 flagellin (Fragment) [fliC] [Salmonella enterica 504  
Q54329\_SALET subsp. AA  
enterica serovar Enteritidis var. jena] align

Score = 187 bits (426), Expect = 3e-47  
Identities = 80/81 (98%), Positives = 81/81 (99%)

Query: 1 KEGDTFDYKGVFTFTIDTKTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQSSKN 60  
KEGDTFDYKGVFTFTIDTKTG+DGNGKVSTTINGEKVTLTVADIATGATDVNAATLQSSKN  
Sbjct: 270 KEGDTFDYKGVFTFTIDTKTGNDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQSSKN 329

Query: 61 VYTSVVNGQFTFDDDKTKNESA 81  
VYTSVVNGQFTFDDDKTKNESA  
Sbjct: 330 VYTSVVNGQFTFDDDKTKNESA 350

tr Q53989 Phase-1 flagellin (Fragment) [fliC] [Salmonella enterica 504  
Q53989\_SALET subsp. AA  
enterica serovar Essen] align

Score = 187 bits (426), Expect = 3e-47  
Identities = 80/81 (98%), Positives = 81/81 (99%)

Query: 1 KEGDTFDYKGVFTFTIDTKTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQSSKN 60  
KEGDTFDYKGVFTFTIDTKTG+DGNGKVSTTINGEKVTLTVADIATGATDVNAATLQSSKN  
Sbjct: 270 KEGDTFDYKGVFTFTIDTKTGNDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQSSKN 329

Query: 61 VYTSVVNGQFTFDDDKTKNESA 81  
VYTSVVNGQFTFDDDKTKNESA

Sbjct: 330 VYTSVVNGQFTFDDKTKNESA 350

tr Q53970 Phase-1 flagellin [fliC] [Salmonella] 505 AA  
Q53970\_SALDU dublin] align

Score = 187 bits (426), Expect = 3e-47  
Identities = 80/81 (98%), Positives = 80/81 (98%)

Query: 1 KEGDTFDYKGVTFITIDTKTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQSSKN 60  
KEGDTFDYKGVTFITIDTKTGDDGNGKVSTTINGEKVTLTVADIATGA DVNAATLQSSKN  
Sbjct: 271 KEGDTFDYKGVTFITIDTKTGDDGNGKVSTTINGEKVTLTVADIATGAADVNAATLQSSKN 330

Query: 61 VYTSVVNGQFTFDDKTKNESA 81  
VYTSVVNGQFTFDDKTKNESA  
Sbjct: 331 VYTSVVNGQFTFDDKTKNESA 351

tr Q53967 Phase-1 flagellin (Fragment) [fliC] [Salmonella enterica] 465  
Q53967\_SALET subsp. AA  
enterica serovar Enteritidis var. danyasz] align

Score = 187 bits (426), Expect = 3e-47  
Identities = 80/81 (98%), Positives = 81/81 (99%)

Query: 1 KEGDTFDYKGVTFITIDTKTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQSSKN 60  
KEGDTFDYKGVTFITIDTKTG+DGNGKVSTTINGEKVTLTVADIATGATDVNAATLQSSKN  
Sbjct: 270 KEGDTFDYKGVTFITIDTKTGNDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQSSKN 329

Query: 61 VYTSVVNGQFTFDDKTKNESA 81  
VYTSVVNGQFTFDDKTKNESA  
Sbjct: 330 VYTSVVNGQFTFDDKTKNESA 350

tr Q53822 Phase-1 flagellin (Fragment) [fliC] [Salmonella enterica] 504  
Q53822\_SALET subsp. AA  
enterica serovar Enteritidis var. chaco] align

Score = 187 bits (426), Expect = 3e-47  
Identities = 80/81 (98%), Positives = 81/81 (99%)

Query: 1 KEGDTFDYKGVTFITIDTKTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQSSKN 60  
KEGDTFDYKGVTFITIDTKTG+DGNGKVSTTINGEKVTLTVADIATGATDVNAATLQSSKN  
Sbjct: 270 KEGDTFDYKGVTFITIDTKTGNDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQSSKN 329

Query: 61 VYTSVVNGQFTFDDKTKNESA 81  
VYTSVVNGQFTFDDKTKNESA  
Sbjct: 330 VYTSVVNGQFTFDDKTKNESA 350

tr Q6V2W1 Phase 1 flagellin [fliC] [Salmonella] 505 AA

Q6V2W1\_9ENTR                      enterica]                      align

Score = 187 bits (425), Expect = 3e-47  
Identities = 80/81 (98%), Positives = 80/81 (98%)

Query: 1    KEGDTFDYKGVFTFTIDTKTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQSSKN 60  
            KEGDTFDYKGVFTFTIDTKTGDDGNGKVSTTINGEKVTLTVADIA GATDVNAATLQSSKN  
Sbjct: 271 KEGDTFDYKGVFTFTIDTKTGDDGNGKVSTTINGEKVTLTVADIAIGATDVNAATLQSSKN 330

Query: 61    VYTSVVNGQFTFDDDKTKNESA 81  
            VYTSVVNGQFTFDDDKTKNESA  
Sbjct: 331 VYTSVVNGQFTFDDDKTKNESA 351

tr   Q79DB7                      Phase 1 flagellin [fliC] [Salmonella enterica subsp.                      505  
     Q79DB7\_SALET              enterica                      AA  
                                 serovar Othmarschen]                      align

Score = 186 bits (424), Expect = 5e-47  
Identities = 80/81 (98%), Positives = 80/81 (98%)

Query: 1    KEGDTFDYKGVFTFTIDTKTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQSSKN 60  
            KEGDTFDYKGVFTFTIDTKTGDDGNGKVSTTINGEKVTLTVADIAT ATDVNAATLQSSKN  
Sbjct: 271 KEGDTFDYKGVFTFTIDTKTGDDGNGKVSTTINGEKVTLTVADIATSATDVNAATLQSSKN 330

Query: 61    VYTSVVNGQFTFDDDKTKNESA 81  
            VYTSVVNGQFTFDDDKTKNESA  
Sbjct: 331 VYTSVVNGQFTFDDDKTKNESA 351

tr   Q57381                      Phase-1 flagellin [fliC1] [Salmonella                      505 AA  
     Q57381\_SALEN              enteritidis]                      align

Score = 186 bits (424), Expect = 5e-47  
Identities = 80/81 (98%), Positives = 80/81 (98%)

Query: 1    KEGDTFDYKGVFTFTIDTKTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQSSKN 60  
            KEGDTFDYKGVFTFTIDTKTGDDGNGKVSTTINGEKVTLTVADIAT ATDVNAATLQSSKN  
Sbjct: 271 KEGDTFDYKGVFTFTIDTKTGDDGNGKVSTTINGEKVTLTVADIATSATDVNAATLQSSKN 330

Query: 61    VYTSVVNGQFTFDDDKTKNESA 81  
            VYTSVVNGQFTFDDDKTKNESA  
Sbjct: 331 VYTSVVNGQFTFDDDKTKNESA 351

tr   Q6V2U9                      Phase 1 flagellin [fliC] [Salmonella                      505 AA  
     Q6V2U9\_9ENTR              enterica]                      align

Score = 186 bits (423), Expect = 6e-47  
Identities = 80/81 (98%), Positives = 80/81 (98%)

Query: 1    KEGDTFDYKGVFTFTIDTKTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQSSKN 60  
            KEGDTFDYKGVFTFTIDTKTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQSSKN

Sbjct: 271 KEGDTFDYKGVFTFTIDTKTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQSSKN 330

Query: 61 VYTSVVNGQFTFDDKTKNESA 81  
VYTSVVNGQFTFDDKTKNESA

Sbjct: 331 VYTSVVNGQFTFDDKTKNESA 351

tr Q53993 Phase 1 flagellin [fliC] [Salmonella 508 AA  
Q53993\_9ENTR enterica] align

Score = 185 bits (422), Expect = 8e-47  
Identities = 79/81 (97%), Positives = 80/81 (98%)

Query: 1 KEGDTFDYKGVFTFTIDTKTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQSSKN 60  
KEGDTFDYKGV+FTIDTKTGDDGNGKVSTTINGEKVTLTVADI TGATDVNAATLQSSKN  
Sbjct: 274 KEGDTFDYKGVSTFTIDTKTGDDGNGKVSTTINGEKVTLTVADITTGATDVNAATLQSSKN 333

Query: 61 VYTSVVNGQFTFDDKTKNESA 81  
VYTSVVNGQFTFDDKTKNESA  
Sbjct: 334 VYTSVVNGQFTFDDKTKNESA 354

Score = 31.4 bits (64), Expect = 2.5  
Identities = 17/39 (43%), Positives = 19/39 (48%), Gaps = 4/39 (10%)

Query: 42 DIATGA--TDVNAATLQSSKNVYTSVVNGQFTFDDKTKN 78  
DI +GA TD A T+ VY NGQ T DD N  
Sbjct: 209 DINS GAVVT DATAPTV--PDKVYVNAANGQLTTDDAQNN 245

sp Q06971 Flagellin (Phase-1-C flagellin) [fliC] [Salmonella dublin] 504 AA  
FLIC\_SALDU align

Score = 184 bits (420), Expect = 2e-46  
Identities = 79/81 (97%), Positives = 79/81 (97%)

Query: 1 KEGDTFDYKGVFTFTIDTKTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQSSKN 60  
KEGDTFDYKGVFTFTIDTKTGDDGNGKVSTTINGEKVTLTVADIA GA DVNAATLQSSKN  
Sbjct: 270 KEGDTFDYKGVFTFTIDTKTGDDGNGKVSTTINGEKVTLTVADIAIGAADVNAATLQSSKN 329

Query: 61 VYTSVVNGQFTFDDKTKNESA 81  
VYTSVVNGQFTFDDKTKNESA  
Sbjct: 330 VYTSVVNGQFTFDDKTKNESA 350

tr Q6V2V3 Phase 1 flagellin [fliC] [Salmonella 505 AA  
Q6V2V3\_9ENTR enterica] align

Score = 184 bits (420), Expect = 2e-46  
Identities = 79/81 (97%), Positives = 79/81 (97%)

Query: 1 KEGDTFDYKGVFTFTIDTKTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQSSKN 60

KEGDTFDYKGVFTFTIDTKTGDDGNGKVSTTINGEKVTLTVADIA GA DVNAATLQSSKN  
Sbjct: 271 KEGDTFDYKGVFTFTIDTKTGDDGNGKVSTTINGEKVTLTVADIAIGAADVNAATLQSSKN 330

Query: 61 VYTSVVGQFTFDDKTKNESA 81  
VYTSVVGQFTFDDKTKNESA  
Sbjct: 331 VYTSVVGQFTFDDKTKNESA 351

tr Q66PR3 Phase 1 flagellin [fliC] [Salmonella] 505 AA  
Q66PR3\_SALDU dublin] align

Score = 184 bits (420), Expect = 2e-46  
Identities = 79/81 (97%), Positives = 79/81 (97%)

Query: 1 KEGDTFDYKGVFTFTIDTKTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQSSKN 60  
KEGDTFDYKGVFTFTIDTKTGDDGNGKVSTTINGEKVTLTVADIA GA DVNAATLQSSKN  
Sbjct: 271 KEGDTFDYKGVFTFTIDTKTGDDGNGKVSTTINGEKVTLTVADIAIGAADVNAATLQSSKN 330

Query: 61 VYTSVVGQFTFDDKTKNESA 81  
VYTSVVGQFTFDDKTKNESA  
Sbjct: 331 VYTSVVGQFTFDDKTKNESA 351

tr Q6V2V2 Phase 1 flagellin [fliC] [Salmonella] 505 AA  
Q6V2V2\_9ENTR enterica] align

Score = 184 bits (420), Expect = 2e-46  
Identities = 79/81 (97%), Positives = 79/81 (97%)

Query: 1 KEGDTFDYKGVFTFTIDTKTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQSSKN 60  
KEGDTFDYKGVFTFTIDTKTGDDGNGKVSTTINGEKVTLTVADIA GA DVNAATLQSSKN  
Sbjct: 271 KEGDTFDYKGVFTFTIDTKTGDDGNGKVSTTINGEKVTLTVADIAIGAADVNAATLQSSKN 330

Query: 61 VYTSVVGQFTFDDKTKNESA 81  
VYTSVVGQFTFDDKTKNESA  
Sbjct: 331 VYTSVVGQFTFDDKTKNESA 351

tr Q66PR5 Phase 1 flagellin [fliC] [Salmonella] 505 AA  
Q66PR5\_SALNA naestved] align

Score = 184 bits (420), Expect = 2e-46  
Identities = 79/81 (97%), Positives = 79/81 (97%)

Query: 1 KEGDTFDYKGVFTFTIDTKTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQSSKN 60  
KEGDTFDYKGVFTFTIDTKTGDDGNGKVSTTINGEKVTLTVADIA GA DVNAATLQSSKN  
Sbjct: 271 KEGDTFDYKGVFTFTIDTKTGDDGNGKVSTTINGEKVTLTVADIAIGAADVNAATLQSSKN 330

Query: 61 VYTSVVGQFTFDDKTKNESA 81  
VYTSVVGQFTFDDKTKNESA  
Sbjct: 331 VYTSVVGQFTFDDKTKNESA 351

sp Q06981      **Flagellin (Phase-1-D flagellin) [fliC] [Salmonella moscow]** 504 AA  
FLIC\_SALMC

align

Score = 184 bits (418), Expect = 3e-46  
Identities = 79/81 (97%), Positives = 80/81 (98%)

Query: 1    KEGDTFDYKGVFTFTIDTKTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQSSKN 60  
            KEGDTFDYKGVFTFTIDTKTGD GNGKVSTTINGEKVTLTVADIAATGAT+VNAATLQSSKN  
Sbjct: 270 KEGDTFDYKGVFTFTIDTKTGDDGNGKVSTTINGEKVTLTVADIATGATNVNAATLQSSKN 329

Query: 61    VYTSVVGQFTFDDKTKNESA 81  
            VYTSVVGQFTFDDKTKNESA  
Sbjct: 330 VYTSVVGQFTFDDKTKNESA 350

tr Q66PR2      **Phase 1 flagellin [fliC] [Salmonella** 505 AA  
Q66PR2\_SALMC      **moscow]** align

Score = 184 bits (418), Expect = 3e-46  
Identities = 79/81 (97%), Positives = 80/81 (98%)

Query: 1    KEGDTFDYKGVFTFTIDTKTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQSSKN 60  
            KEGDTFDYKGVFTFTIDTKTGD GNGKVSTTINGEKVTLTVADIATGAT+VNAATLQSSKN  
Sbjct: 271 KEGDTFDYKGVFTFTIDTKTGDDGNGKVSTTINGEKVTLTVADIATGATNVNAATLQSSKN 330

Query: 61    VYTSVVGQFTFDDKTKNESA 81  
            VYTSVVGQFTFDDKTKNESA  
Sbjct: 331 VYTSVVGQFTFDDKTKNESA 351

tr Q6V2V0      **Phase 1 flagellin [fliC] [Salmonella** 505 AA  
Q6V2V0\_9ENTR      **enterica]** align

Score = 184 bits (418), Expect = 3e-46  
Identities = 79/81 (97%), Positives = 80/81 (98%)

Query: 1    KEGDTFDYKGVFTFTIDTKTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQSSKN 60  
            KEGDTFDYKGVFTFTIDTKTGD GNGKVSTTINGEKVTLTVADIATGAT+VNAATLQSSKN  
Sbjct: 271 KEGDTFDYKGVFTFTIDTKTGDDGNGKVSTTINGEKVTLTVADIATGATNVNAATLQSSKN 330

Query: 61    VYTSVVGQFTFDDKTKNESA 81  
            VYTSVVGQFTFDDKTKNESA  
Sbjct: 331 VYTSVVGQFTFDDKTKNESA 351

sp Q06982      **Flagellin (Phase-1-C flagellin) [fliC] [Salmonella** 504  
FLIC\_SALRO rostock] AA  
align

Score = 182 bits (415), Expect = 7e-46  
Identities = 78/81 (96%), Positives = 78/81 (96%)

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Search  for

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NCBI BLAST program reference [PMID:9254694]:

Altschul S.F., Madden T.L., Schäffer A.A., Zhang J., Zhang Z., Miller W., Lipman D.J. Gapped BLAST and PSI-BLAST: a new generation of protein database search programs. Nucleic Acids Res. 25:3389-3402(1997).

Query: 40 AA

Date run: 2005-07-06 11:57:55 UTC+0100 on sib-gml.unil.ch

Program: NCBI BLASTP 1.5.4-Paracel [2003-06-05]

Database: EXPASY/UniProtKB

2,035,690 sequences; 659,769,346 total letters

UniProt Knowledgebase Release 5.4 consists of:

UniProtKB/Swiss-Prot Release 47.4 of 05-Jul-2005: 186882 entries

UniProtKB/TrEMBL Release 30.4 of 05-Jul-2005: 1837312 entries

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#### List of potentially matching sequences

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Db AC	Description	Score	E-value
<input type="checkbox"/> sp <a href="#">Q06973</a>	FLIC_SALMO Flagellin (Phase-1-C flagellin) [fliC] [Sal...	102	8e-22
<input type="checkbox"/> sp <a href="#">Q06972</a>	FLIC_SALEN Flagellin (Phase-1-C flagellin) [fliC] [Sal...	102	8e-22
<input type="checkbox"/> tr <a href="#">Q53WZ9</a>	_SALEN Phase 1 flagellin [fliC] [Salmonella enteritidis]	102	8e-22
<input type="checkbox"/> tr <a href="#">Q6V2W5</a>	_9ENTR Phase 1 flagellin [fliC] [Salmonella enterica]	102	8e-22
<input type="checkbox"/> tr <a href="#">Q6V2V9</a>	_9ENTR Phase 1 flagellin [fliC] [Salmonella enterica]	102	8e-22
<input type="checkbox"/> tr <a href="#">Q66PR7</a>	_SALMO Phase 1 flagellin [fliC] [Salmonella montevideo]	102	8e-22
<input type="checkbox"/> tr <a href="#">Q6LDG7</a>	_SALGL Phase-1 flagellin [fliC1] [Salmonella gallinarum]	102	8e-22
<input type="checkbox"/> tr <a href="#">Q6LDG6</a>	_SALET Phase-1 flagellin [fliC1] [Salmonella enterica s...]	102	8e-22
<input type="checkbox"/> tr <a href="#">Q66PR6</a>	_SALET Phase 1 flagellin [fliC] [Salmonella enterica su...]	102	8e-22

<input type="checkbox"/>	tr	<u>Q66PN4</u>	_SALET Phase 1 flagellin [fliC] [Salmonella enterica su...	<u>102</u>	8e-22
<input type="checkbox"/>	tr	<u>Q66PN3</u>	_SALET Phase 1 flagellin [fliC] [Salmonella enterica su...	<u>102</u>	8e-22
<input type="checkbox"/>	tr	<u>Q54864</u>	_SALPU Phase-1 flagellin [fliC] [Salmonella pullorum]	<u>102</u>	8e-22
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<input type="checkbox"/>	tr	<u>Q54210</u>	_SALGL Phase-1 flagellin [fliC1] [Salmonella gallinarum]	<u>102</u>	8e-22
<input type="checkbox"/>	tr	<u>Q53998</u>	_SALEN Phase-1 flagellin (Fragment) [fliC] [Salmonella ...]	<u>102</u>	8e-22
<input type="checkbox"/>	tr	<u>Q54329</u>	_SALET Phase-1 flagellin (Fragment) [fliC] [Salmonella ...]	<u>101</u>	2e-21
<input type="checkbox"/>	tr	<u>Q53989</u>	_SALET Phase-1 flagellin (Fragment) [fliC] [Salmonella ...]	<u>101</u>	2e-21
<input type="checkbox"/>	tr	<u>Q53967</u>	_SALET Phase-1 flagellin (Fragment) [fliC] [Salmonella ...]	<u>101</u>	2e-21
<input type="checkbox"/>	tr	<u>Q53822</u>	_SALET Phase-1 flagellin (Fragment) [fliC] [Salmonella ...]	<u>101</u>	2e-21
<input type="checkbox"/>	tr	<u>Q53993</u>	_9ENTR Phase 1 flagellin [fliC] [Salmonella enterica]	<u>100</u>	3e-21
<input type="checkbox"/>	tr	<u>Q53970</u>	_SALDU Phase-1 flagellin [fliC1] [Salmonella dublin]	<u>100</u>	3e-21
<input type="checkbox"/>	tr	<u>Q79DB7</u>	_SALET Phase 1 flagellin [fliC] [Salmonella enterica su...	<u>100</u>	5e-21
<input type="checkbox"/>	tr	<u>Q57381</u>	_SALEN Phase-1 flagellin [fliC1] [Salmonella enteritidis]	<u>100</u>	5e-21
<input type="checkbox"/>	tr	<u>Q6V2W1</u>	_9ENTR Phase 1 flagellin [fliC] [Salmonella enterica]	<u>100</u>	6e-21
<input type="checkbox"/>	tr	<u>Q6V2U9</u>	_9ENTR Phase 1 flagellin [fliC] [Salmonella enterica]	<u>100</u>	6e-21
<input type="checkbox"/>	sp	<u>Q06981</u>	FLIC_SALMC Flagellin (Phase-1-D flagellin) [fliC] [Sal...	<u>98</u>	1e-20
<input type="checkbox"/>	tr	<u>Q66PR2</u>	_SALMC Phase 1 flagellin [fliC] [Salmonella moscow]	<u>98</u>	1e-20
<input type="checkbox"/>	tr	<u>Q6V2V0</u>	_9ENTR Phase 1 flagellin [fliC] [Salmonella enterica]	<u>98</u>	1e-20
<input type="checkbox"/>	sp	<u>Q52959</u>	FLIC_SALNA Phase-1 flagellin [fliC] [Salmonella naestved]	<u>97</u>	3e-20
<input type="checkbox"/>	sp	<u>Q06971</u>	FLIC_SALDU Flagellin (Phase-1-C flagellin) [fliC] [Sal...	<u>97</u>	3e-20
<input type="checkbox"/>	tr	<u>Q6V2V3</u>	_9ENTR Phase 1 flagellin [fliC] [Salmonella enterica]	<u>97</u>	3e-20
<input type="checkbox"/>	tr	<u>Q66PR3</u>	_SALDU Phase 1 flagellin [fliC] [Salmonella dublin]	<u>97</u>	3e-20
<input type="checkbox"/>	tr	<u>Q6V2V2</u>	_9ENTR Phase 1 flagellin [fliC] [Salmonella enterica]	<u>97</u>	3e-20
<input type="checkbox"/>	tr	<u>Q66PR5</u>	_SALNA Phase 1 flagellin [fliC] [Salmonella naestved]	<u>97</u>	3e-20
<input type="checkbox"/>	tr	<u>Q6V2V5</u>	_9ENTR Phase 1 flagellin [fliC] [Salmonella enterica]	<u>97</u>	5e-20
<input type="checkbox"/>	sp	<u>Q06982</u>	FLIC_SALRO Flagellin (Phase-1-C flagellin) [fliC] [Sal...	<u>95</u>	1e-19
<input type="checkbox"/>	tr	<u>Q66PR4</u>	_SALRO Phase 1 flagellin [fliC] [Salmonella rostock]	<u>95</u>	1e-19
<input type="checkbox"/>	tr	<u>Q6V2V1</u>	_9ENTR Phase 1 flagellin [fliC] [Salmonella enterica]	<u>95</u>	1e-19
<input type="checkbox"/>	sp	<u>Q06968</u>	FLIC_SALBE Flagellin (Phase-1-I flagellin) [fliC] [Sal...	<u>93</u>	7e-19
<input type="checkbox"/>	tr	<u>Q6V2H1</u>	_9ENTR Phase 1 flagellin [fliC] [Salmonella enterica]	<u>93</u>	7e-19
<input type="checkbox"/>	tr	<u>Q53583</u>	_SALET Phase-1 flagellin (Fragment) [fliC] [Salmonella ...]	<u>93</u>	7e-19
<input type="checkbox"/>	sp	<u>Q06970</u>	FLIC_SALDE Flagellin (Phase-1-C flagellin) [fliC] [Sal...	<u>91</u>	2e-18
<input type="checkbox"/>	tr	<u>Q6V2X1</u>	_9ENTR Phase 1 flagellin [fliC] [Salmonella enterica]	<u>91</u>	2e-18
<input type="checkbox"/>	tr	<u>Q66PR8</u>	_SALDE Phase 1 flagellin [fliC] [Salmonella derby]	<u>91</u>	2e-18
<input type="checkbox"/>	tr	<u>Q6V2W8</u>	_9ENTR Phase 1 flagellin [fliC] [Salmonella enterica]	<u>91</u>	2e-18
<input type="checkbox"/>	tr	<u>Q66PS0</u>	_SALET Phase 1 flagellin [fliC] [Salmonella enterica su...	<u>91</u>	2e-18
<input type="checkbox"/>	tr	<u>Q53992</u>	_9ENTR Phase 1 flagellin [fliC] [Salmonella enterica]	<u>91</u>	3e-18
<input type="checkbox"/>	tr	<u>Q6V2G9</u>	_9ENTR Phase 1 flagellin [fliC] [Salmonella enterica]	<u>90</u>	4e-18
<input type="checkbox"/>	tr	<u>Q66PR9</u>	_9ENTR Phase 1 flagellin [fliC] [Salmonella enterica su...	<u>90</u>	4e-18
<input type="checkbox"/>	tr	<u>Q53990</u>	_9ENTR Phase 1 flagellin [fliC] [Salmonella enterica]	<u>90</u>	4e-18
<input type="checkbox"/>	tr	<u>Q53991</u>	_9ENTR Phase 1 flagellin [fliC] [Salmonella enterica]	<u>90</u>	5e-18
<input type="checkbox"/>	tr	<u>Q66PQ9</u>	_9ENTR Phase 1 flagellin [fliC] [Salmonella enterica su...	<u>90</u>	5e-18
<input type="checkbox"/>	tr	<u>Q66PQ8</u>	_SALEE Phase 1 flagellin [fliC] [Salmonella enterica VI...	<u>90</u>	5e-18
<input type="checkbox"/>	tr	<u>Q53996</u>	_9ENTR Phase 1 flagellin [fliC] [Salmonella enterica]	<u>90</u>	5e-18

<input type="checkbox"/>	tr	<a href="#">Q66PR1</a>	_SALSE Phase 1 flagellin [fliC] [Salmonella senftenberg]	<a href="#">88</a>	2e-17
<input type="checkbox"/>	tr	<a href="#">Q54489</a>	_SALET Phase 1 flagellin [fliC] [Salmonella enterica su...]	<a href="#">87</a>	4e-17
<input type="checkbox"/>	tr	<a href="#">Q6V2X0</a>	_9ENTR Phase 1 flagellin [fliC] [Salmonella enterica]	<a href="#">87</a>	4e-17
<input type="checkbox"/>	tr	<a href="#">Q6V2U0</a>	_9ENTR Phase 1 flagellin [fliC] [Salmonella enterica]	<a href="#">87</a>	4e-17
<input type="checkbox"/>	sp	<a href="#">Q06983</a>	FLIC_SALSE Flagellin (Phase-1-C flagellin) [fliC] [Sal...]	<a href="#">87</a>	5e-17
<input type="checkbox"/>	sp	<a href="#">Q06969</a>	FLIC_SALBU Flagellin (Phase-1-C flagellin) [fliC] [Sal...]	<a href="#">87</a>	5e-17
<input type="checkbox"/>	tr	<a href="#">Q66PR0</a>	_SALBU Phase 1 flagellin [fliC] [Salmonella budapest]	<a href="#">87</a>	5e-17
<input type="checkbox"/>	tr	<a href="#">Q6V2U7</a>	_9ENTR Phase 1 flagellin [fliC] [Salmonella enterica]	<a href="#">87</a>	5e-17
<input type="checkbox"/>	tr	<a href="#">Q6V2U6</a>	_9ENTR Phase 1 flagellin [fliC] [Salmonella enterica]	<a href="#">87</a>	5e-17
<input type="checkbox"/>	tr	<a href="#">Q6LD27</a>	_SALET Phase-1 flagellin (Fragment) [fliC] [Salmonella ...]	<a href="#">87</a>	5e-17
<input type="checkbox"/>	tr	<a href="#">Q53995</a>	_9ENTR Phase 1 flagellin [fliC] [Salmonella enterica]	<a href="#">85</a>	2e-16
<input type="checkbox"/>	tr	<a href="#">Q54414</a>	_SALET Phase-1 flagellin (Fragment) [fliC] [Salmonella ...]	<a href="#">85</a>	2e-16
<input type="checkbox"/>	tr	<a href="#">Q9R406</a>	_SALPU Phase 1 flagellin C (Fragment) [fliC] [Salmonell...]	<a href="#">82</a>	9e-16
<input type="checkbox"/>	tr	<a href="#">Q9R405</a>	_SALGL Phase 1 flagellin C (Fragment) [fliC] [Salmonell...]	<a href="#">82</a>	9e-16
<input type="checkbox"/>	tr	<a href="#">Q9R2V0</a>	_SALPU Phase 1 flagellin C (Fragment) [fliC] [Salmonell...]	<a href="#">82</a>	9e-16
<input type="checkbox"/>	sp	<a href="#">Q06974</a>	FLIC_SALON Flagellin (Phase-1-C flagellin) [fliC] [Sal...]	<a href="#">81</a>	2e-15
<input type="checkbox"/>	tr	<a href="#">Q6V2V7</a>	_9ENTR Phase 1 flagellin [fliC] [Salmonella enterica]	<a href="#">81</a>	2e-15
<input type="checkbox"/>	tr	<a href="#">Q6V2U4</a>	_9ENTR Phase 1 flagellin [fliC] [Salmonella enterica]	<a href="#">81</a>	2e-15
<input type="checkbox"/>	tr	<a href="#">Q6V2U1</a>	_9ENTR Phase 1 flagellin [fliC] [Salmonella enterica]	<a href="#">81</a>	2e-15
<input type="checkbox"/>	tr	<a href="#">Q6LD24</a>	_SALET Phase 1 flagellin [fliC] [Salmonella enterica su...]	<a href="#">81</a>	2e-15
<input type="checkbox"/>	tr	<a href="#">Q54415</a>	_SALET Phase-1 flagellin (Fragment) [fliC] [Salmonella ...]	<a href="#">81</a>	2e-15
<input type="checkbox"/>	tr	<a href="#">Q53821</a>	_SALET Phase-1 flagellin (Fragment) [fliC] [Salmonella ...]	<a href="#">81</a>	2e-15
<input type="checkbox"/>	tr	<a href="#">Q6V2U3</a>	_9ENTR Phase 1 flagellin [fliC] [Salmonella enterica]	<a href="#">81</a>	3e-15
<input type="checkbox"/>	tr	<a href="#">Q6V2T7</a>	_9ENTR Phase 1 flagellin [fliC] [Salmonella enterica]	<a href="#">80</a>	4e-15
<input type="checkbox"/>	tr	<a href="#">Q53994</a>	_9ENTR Phase 1 flagellin [fliC] [Salmonella enterica]	<a href="#">79</a>	1e-14
<input type="checkbox"/>	tr	<a href="#">Q6V2G8</a>	_9ENTR Phase 1 flagellin [fliC] [Salmonella enterica]	<a href="#">79</a>	1e-14
<input type="checkbox"/>	tr	<a href="#">Q54515</a>	_SALET Phase 1 flagellin [fliC] [Salmonella enterica su...]	<a href="#">78</a>	2e-14
<input type="checkbox"/>	tr	<a href="#">Q6V2G7</a>	_9ENTR Phase 1 flagellin [fliC] [Salmonella enterica]	<a href="#">77</a>	4e-14
<input type="checkbox"/>	tr	<a href="#">Q5G1R0</a>	_SALGL FliC (Fragment) [fliC] [Salmonella gallinarum]	<a href="#">70</a>	4e-12
<input type="checkbox"/>	tr	<a href="#">Q5G1Q9</a>	_SALPU FliC (Fragment) [fliC] [Salmonella pullorum]	<a href="#">60</a>	6e-09
<input type="checkbox"/>	tr	<a href="#">Q5G1Q8</a>	_SALGL FliC (Fragment) [fliC] [Salmonella gallinarum]	<a href="#">47</a>	4e-05
<input type="checkbox"/>	tr	<a href="#">Q51ZS6</a>	_MAGGR Hypothetical protein [MG05960.4] [Magnaporthe gr...]	<a href="#">35</a>	0.18
<input type="checkbox"/>	tr	<a href="#">Q89HH8</a>	_BRAJA Blr6013 protein [blr6013] [Bradyrhizobium japoni...]	<a href="#">33</a>	0.78
<input type="checkbox"/>	tr	<a href="#">Q99U54</a>	_STAAN EbhA protein [ebhA] [Staphylococcus aureus (stra...]	<a href="#">32</a>	1.0
<input type="checkbox"/>	tr	<a href="#">Q931R6</a>	_STAAM Hypothetical protein ebhA [ebhA] [Staphylococcus...]	<a href="#">32</a>	1.0
<input type="checkbox"/>	tr	<a href="#">Q76DK5</a>	_SALET Phase II flagellin [fljB] [Salmonella enterica s...]	<a href="#">32</a>	1.0
<input type="checkbox"/>	tr	<a href="#">Q08294</a>	_YEAST S.cerevisiae chromosome XV reading frame ORF YOL...]	<a href="#">32</a>	1.0
<input type="checkbox"/>	tr	<a href="#">Q05164</a>	_YEAST AOF1001 protein [AOF1001] [Saccharomyces cerevis...]	<a href="#">32</a>	1.0
<input type="checkbox"/>	tr	<a href="#">Q8ZN57</a>	_SALTY Similar to the C-terminal region of AIDA [shdA] ...]	<a href="#">32</a>	1.4
<input type="checkbox"/>	tr	<a href="#">Q9XCJ4</a>	_SALTY ShdA [shdA] [Salmonella typhimurium]	<a href="#">32</a>	1.4
<input type="checkbox"/>	tr	<a href="#">Q6MK32</a>	_BDEBA Cell wall surface anchor family protein precurs...]	<a href="#">32</a>	1.9
<input type="checkbox"/>	tr	<a href="#">Q6E6Y7</a>	_CITFR Flagellin (Fragment) [fliC] [Citrobacter freundii]	<a href="#">32</a>	1.9
<input type="checkbox"/>	tr	<a href="#">Q8E9G6</a>	_SHEON RTX toxin, putative [SO4317] [Shewanella oneiden...]	<a href="#">31</a>	2.5
<input type="checkbox"/>	tr	<a href="#">Q68L35</a>	_9DIPT Optomotor blind (Fragment) [omb] [Drosophila pol...]	<a href="#">31</a>	2.5
<input type="checkbox"/>	tr	<a href="#">Q8NWQ6</a>	_STAAW Ebh protein [ebh] [Staphylococcus aureus (strain...]	<a href="#">31</a>	3.3

☐ tr Q74A98 \_GEOSL Sensory box histidine kinase [GSU2492] [Geobacte... 31 3.3

**Graphical overview of the alignments**

[Click here](#) to resubmit your query after masking regions matching PROSITE profiles  
or Pfam HMMs  
( [Help](#)) (use [ScanProsite](#) for more details about PROSITE matches)

**Profile hits**   
**Pfam hits** 

Submission	Matches on query sequence				Mat
	1				
FLIC_SALMO	=====				=====
FLIC_SALEN	=====				=====
Q53M29	=====				=====
Q6V2M5	=====				=====
Q6V2V9	=====				=====
Q66PR7	=====				=====
Q6LDG7	=====				=====
Q6LDG6	=====				=====
Q66PR6	=====				=====
Q66PN4	=====				=====
Q66PN3	=====				=====
Q54864	=====				=====
Q54863	=====				=====
Q54210	=====				=====
Q53998	=====				=====
Q54329	=====				=====
Q53989	=====				=====
Q53967	=====				=====
Q53822	=====				=====
Q53993	=====				=====
Q53970	=====				=====
Q79DB7	=====				=====
Q57381	=====				=====
Q6V2M1	=====				=====
Q6V2U9	=====				=====
FLIC_SALMC	=====				=====
Q66PR2	=====				=====
Q6V2V0	=====				=====
FLIC_SALNA	=====				=====
FLIC_SALDU	=====				=====
Q6V2V3	=====				=====
Q66PR3	=====				=====
Q6V2V2	=====				=====
Q66PR5	=====				=====
Q6V2V5	=====				=====
FLIC_SALRO	=====				=====
Q66PR4	=====				=====
Q6V2V1	=====				=====
FLIC_SALBE	=====				=====
Q6V2H1	=====				=====
Q53583	=====				=====
FLIC_SALDE	=====				=====
Q6V2X1	=====				=====
Q66PR8	=====				=====
Q6V2H8	=====				=====
Q66PS0	=====				=====
Q53992	=====				=====
Q6V2G9	=====				=====
Q66PR9	=====				=====
Q53990	=====				=====
Q53991	=====				=====
Q66PQ9	=====				=====
Q66PQ8	=====				=====
Q53996	=====				=====
Q66PR1	=====				=====
Q54489	=====				=====
Q6V2X0	=====				=====
Q6V2U0	=====				=====
FLIC_SALSE	=====				=====
FLIC_SALBU	=====				=====
Q66PR0	=====				=====
Q6V2U7	=====				=====
Q6V2U6	=====				=====
Q6LD27	=====				=====
Q53995	=====				=====
Q54414	=====				=====
Q9R406	=====				=====
Q9R405	=====				=====
Q9R2V0	=====				=====
FLIC_SALON	=====				=====
Q6V2V7	=====				=====
Q6V2U4	=====				=====
Q6V2U1	=====				=====
Q6LD24	=====				=====
Q54415	=====				=====
Q53821	=====				=====
Q6V2U3	=====				=====
Q6V2T7	=====				=====
Q53994	=====				=====
Q6V2G8	=====				=====
Q54515	=====				=====
Q6V2G7	=====				=====
Q5G1R0	=====				=====
Q5G1Q9	=====				=====
Q5G1Q8	=====				=====
Q51ZS6	=====				=====



tr Q6V2V9 Phase 1 flagellin [fliC] [Salmonella enterica] 505 AA  
Q6V2V9\_9ENTR  
[align](#)

Score = 102 bits (236), Expect = 8e-22  
Identities = 40/40 (100%), Positives = 40/40 (100%)

Query: 1 KTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQS 40  
KTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQS  
Sbjct: 288 KTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQS 327

tr Q66PR7 Phase 1 flagellin [fliC] [Salmonella montevideo] 505 AA  
Q66PR7\_SALMO  
[align](#)

Score = 102 bits (236), Expect = 8e-22  
Identities = 40/40 (100%), Positives = 40/40 (100%)

Query: 1 KTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQS 40  
KTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQS  
Sbjct: 288 KTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQS 327

tr Q6LDG7 Phase-1 flagellin [fliC1] [Salmonella gallinarum] 505 AA  
Q6LDG7\_SALGL  
[align](#)

Score = 102 bits (236), Expect = 8e-22  
Identities = 40/40 (100%), Positives = 40/40 (100%)

Query: 1 KTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQS 40  
KTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQS  
Sbjct: 288 KTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQS 327

tr Q6LDG6 Phase-1 flagellin [fliC1] [Salmonella enterica subsp. 505  
Q6LDG6\_SALET enterica AA  
serovar Gallinarum/pullorum] [align](#)

Score = 102 bits (236), Expect = 8e-22  
Identities = 40/40 (100%), Positives = 40/40 (100%)

Query: 1 KTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQS 40  
KTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQS  
Sbjct: 288 KTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQS 327

tr Q66PR6 Phase 1 flagellin [fliC] [Salmonella enterica subsp. 505  
Q66PR6\_SALET enterica AA  
serovar Enteritidis] [align](#)

Score = 102 bits (236), Expect = 8e-22  
Identities = 40/40 (100%), Positives = 40/40 (100%)

Query: 1 KTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQS 40  
KTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQS  
Sbjct: 288 KTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQS 327

tr Q66PN4 Phase 1 flagellin [fliC] [Salmonella enterica subsp. 505  
Q66PN4\_SALET enterica AA  
serovar Emek] align

Score = 102 bits (236), Expect = 8e-22  
Identities = 40/40 (100%), Positives = 40/40 (100%)

Query: 1 KTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQS 40  
KTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQS  
Sbjct: 288 KTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQS 327

tr Q66PN3 Phase 1 flagellin [fliC] [Salmonella enterica subsp. 505  
Q66PN3\_SALET enterica AA  
serovar Enteritidis] align

Score = 102 bits (236), Expect = 8e-22  
Identities = 40/40 (100%), Positives = 40/40 (100%)

Query: 1 KTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQS 40  
KTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQS  
Sbjct: 288 KTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQS 327

tr Q54864 Phase-1 flagellin [fliC] [Salmonella pullorum] 505 AA  
Q54864\_SALPU align

Score = 102 bits (236), Expect = 8e-22  
Identities = 40/40 (100%), Positives = 40/40 (100%)

Query: 1 KTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQS 40  
KTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQS  
Sbjct: 288 KTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQS 327

tr Q54863 Phase-1 flagellin [fliC] [Salmonella pullorum] 505 AA  
Q54863\_SALPU align

Score = 102 bits (236), Expect = 8e-22  
Identities = 40/40 (100%), Positives = 40/40 (100%)

Query: 1 KTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQS 40  
KTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQS  
Sbjct: 288 KTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQS 327

tr Q54210 Phase-1 flagellin [fliC1] [Salmonella gallinarum] 494 AA  
Q54210\_SALGL

align

Score = 102 bits (236), Expect = 8e-22  
Identities = 40/40 (100%), Positives = 40/40 (100%)

Query: 1 KTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQS 40  
KTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQS  
Sbjct: 288 KTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQS 327

tr Q53998 Phase-1 flagellin (Fragment) [fliC] [Salmonella  
Q53998\_SALEN enteritidis]

493  
AA  
align

Score = 102 bits (236), Expect = 8e-22  
Identities = 40/40 (100%), Positives = 40/40 (100%)

Query: 1 KTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQS 40  
KTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQS  
Sbjct: 276 KTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQS 315

tr Q54329 Phase-1 flagellin (Fragment) [fliC] [Salmonella enterica 504  
Q54329\_SALET subsp. AA  
enterica serovar Enteritidis var. jena] align

Score = 101 bits (233), Expect = 2e-21  
Identities = 39/40 (97%), Positives = 40/40 (99%)

Query: 1 KTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQS 40  
KTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQS  
Sbjct: 287 KTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQS 326

tr Q53989 Phase-1 flagellin (Fragment) [fliC] [Salmonella enterica 504  
Q53989\_SALET subsp. AA  
enterica serovar Essen] align

Score = 101 bits (233), Expect = 2e-21  
Identities = 39/40 (97%), Positives = 40/40 (99%)

Query: 1 KTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQS 40  
KTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQS  
Sbjct: 287 KTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQS 326

tr Q53967 Phase-1 flagellin (Fragment) [fliC] [Salmonella enterica] 465  
Q53967\_SALET subsp. AA  
enterica serovar Enteritidis var. danysz] align

Score = 101 bits (233), Expect = 2e-21  
Identities = 39/40 (97%), Positives = 40/40 (99%)

Query: 1 KTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQS 40  
KTG+DNGKVSTTINGEKVTLTVADIATGATDVNAATLQS  
Sbjct: 287 KTGNDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQS 326

tr Q53822 Phase-1 flagellin (Fragment) [fliC] [Salmonella enterica] 504  
Q53822\_SALET subsp. AA  
enterica serovar Enteritidis var. chaco] align

Score = 101 bits (233), Expect = 2e-21  
Identities = 39/40 (97%), Positives = 40/40 (99%)

Query: 1 KTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQS 40  
KTG+DNGKVSTTINGEKVTLTVADIATGATDVNAATLQS  
Sbjct: 287 KTGNDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQS 326

tr Q53993 Phase 1 flagellin [fliC] [Salmonella enterica] 508 AA  
Q53993\_9ENTR align

Score = 100 bits (232), Expect = 3e-21  
Identities = 39/40 (97%), Positives = 40/40 (99%)

Query: 1 KTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQS 40  
KTGDDGNGKVSTTINGEKVTLTVADI+TGATDVNAATLQS  
Sbjct: 291 KTGDDGNGKVSTTINGEKVTLTVADITTGATDVNAATLQS 330

tr Q53970 Phase-1 flagellin [fliC1] [Salmonella dublin] 505 AA  
Q53970\_SALDU align

Score = 100 bits (231), Expect = 3e-21  
Identities = 39/40 (97%), Positives = 40/40 (99%)

Query: 1 KTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQS 40  
KTGDDGNGKVSTTINGEKVTLTVADIATGA+DVNAATLQS  
Sbjct: 288 KTGDDGNGKVSTTINGEKVTLTVADIATGAADVNAATLQS 327

tr Q79DB7 Phase 1 flagellin [fliC] [Salmonella enterica subsp. 505  
Q79DB7\_SALET enterica AA  
serovar Othmarschen] align

Score = 100 bits (230), Expect = 5e-21  
Identities = 39/40 (97%), Positives = 39/40 (97%)

Query: 1 KTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQS 40  
KTGDDGNGKVSTTINGEKVTLTVADIAT ATDVNAATLQS  
Sbjct: 288 KTGDDGNGKVSTTINGEKVTLTVADIATSATDVNAATLQS 327

tr Q57381 Phase-1 flagellin [fliC1] [Salmonella enteritidis] 505 AA  
Q57381\_SALEN align

Score = 100 bits (230), Expect = 5e-21  
Identities = 39/40 (97%), Positives = 39/40 (97%)

Query: 1 KTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQS 40  
KTGDDGNGKVSTTINGEKVTLTVADIAT ATDVNAATLQS  
Sbjct: 288 KTGDDGNGKVSTTINGEKVTLTVADIATSATDVNAATLQS 327

tr Q6V2W1 Phase 1 flagellin [fliC] [Salmonella enterica] 505 AA  
Q6V2W1\_9ENTR align

Score = 99.6 bits (229), Expect = 6e-21  
Identities = 39/40 (97%), Positives = 39/40 (97%)

Query: 1 KTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQS 40  
KTGDDGNGKVSTTINGEKVTLTVADIA GATDVNAATLQS  
Sbjct: 288 KTGDDGNGKVSTTINGEKVTLTVADIAIGATDVNAATLQS 327

tr Q6V2U9 Phase 1 flagellin [fliC] [Salmonella enterica] 505 AA  
Q6V2U9\_9ENTR align

Score = 99.6 bits (229), Expect = 6e-21  
Identities = 39/40 (97%), Positives = 39/40 (97%)

Query: 1 KTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQS 40  
KTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQS  
Sbjct: 288 KTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQS 327

sp Q06981 Flagellin (Phase-1-D flagellin) [fliC] [Salmonella moscow] 504 AA  
FLIC\_SALMC align

Score = 98.3 bits (226), Expect = 1e-20  
Identities = 38/40 (95%), Positives = 39/40 (97%)

Query: 1 KTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQS 40  
KTGD GNGKVSTTINGEKVTLTVADIATGAT+VNAATLQS  
Sbjct: 287 KTGDGGNGKVSTTINGEKVTLTVADIATGATNVNAATLQS 326

tr Q66PR2 Phase 1 flagellin [fliC] [Salmonella moscow] 505 AA  
Q66PR2\_SALMC

[align](#)

Score = 98.3 bits (226), Expect = 1e-20  
Identities = 38/40 (95%), Positives = 39/40 (97%)

Query: 1 KTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQS 40  
KTGD GNGKVSTTINGEKVTLTVADIATGAT+VNAATLQS  
Sbjct: 288 KTGDGGNGKVSTTINGEKVTLTVADIATGATNVNAATLQS 327

tr Q6V2V0 Phase 1 flagellin [fliC] [Salmonella enterica] 505 AA  
Q6V2V0\_9ENTR

[align](#)

Score = 98.3 bits (226), Expect = 1e-20  
Identities = 38/40 (95%), Positives = 39/40 (97%)

Query: 1 KTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQS 40  
KTGD GNGKVSTTINGEKVTLTVADIATGAT+VNAATLQS  
Sbjct: 288 KTGDGGNGKVSTTINGEKVTLTVADIATGATNVNAATLQS 327

sp O52959 Phase-1 flagellin [fliC] [Salmonella naestved] 504 AA  
FLIC\_SALNA

[align](#)

Score = 97.5 bits (224), Expect = 3e-20  
Identities = 38/40 (95%), Positives = 39/40 (97%)

Query: 1 KTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQS 40  
KTGDDGNGKVSTTINGEKVTLTVADIA GA+DVNAATLQS  
Sbjct: 287 KTGDDGNGKVSTTINGEKVTLTVADIAIGAADVNAATLQS 326

sp Q06971 Flagellin (Phase-1-C flagellin) [fliC] [Salmonella dublin] 504 AA  
FLIC\_SALDU

[align](#)

Score = 97.5 bits (224), Expect = 3e-20  
Identities = 38/40 (95%), Positives = 39/40 (97%)

Query: 1 KTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQS 40  
KTGDDGNGKVSTTINGEKVTLTVADIA GA+DVNAATLQS  
Sbjct: 287 KTGDDGNGKVSTTINGEKVTLTVADIAIGAADVNAATLQS 326

tr Q6V2V3 Phase 1 flagellin [fliC] [Salmonella enterica] 505 AA  
Q6V2V3\_9ENTR  
[align](#)

Score = 97.5 bits (224), Expect = 3e-20  
Identities = 38/40 (95%), Positives = 39/40 (97%)

Query: 1 KTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQS 40  
KTGDDGNGKVSTTINGEKVTLTVADIA GA+DVNAATLQS  
Sbjct: 288 KTGDDGNGKVSTTINGEKVTLTVADIAIGAADVNAATLQS 327

tr Q66PR3 Phase 1 flagellin [fliC] [Salmonella dublin] 505 AA  
Q66PR3\_SALDU  
[align](#)

Score = 97.5 bits (224), Expect = 3e-20  
Identities = 38/40 (95%), Positives = 39/40 (97%)

Query: 1 KTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQS 40  
KTGDDGNGKVSTTINGEKVTLTVADIA GA+DVNAATLQS  
Sbjct: 288 KTGDDGNGKVSTTINGEKVTLTVADIAIGAADVNAATLQS 327

tr Q6V2V2 Phase 1 flagellin [fliC] [Salmonella enterica] 505 AA  
Q6V2V2\_9ENTR  
[align](#)

Score = 97.5 bits (224), Expect = 3e-20  
Identities = 38/40 (95%), Positives = 39/40 (97%)

Query: 1 KTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQS 40  
KTGDDGNGKVSTTINGEKVTLTVADIA GA+DVNAATLQS  
Sbjct: 288 KTGDDGNGKVSTTINGEKVTLTVADIAIGAADVNAATLQS 327

tr Q66PR5 Phase 1 flagellin [fliC] [Salmonella naestved] 505 AA  
Q66PR5\_SALNA  
[align](#)

Score = 97.5 bits (224), Expect = 3e-20  
Identities = 38/40 (95%), Positives = 39/40 (97%)

Query: 1 KTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQS 40  
KTGDDGNGKVSTTINGEKVTLTVADIA GA+DVNAATLQS  
Sbjct: 288 KTGDDGNGKVSTTINGEKVTLTVADIAIGAADVNAATLQS 327

tr Q6V2V5 Phase 1 flagellin [fliC] [Salmonella enterica] 505 AA  
Q6V2V5\_9ENTR

align

Score = 96.7 bits (222), Expect = 5e-20  
Identities = 37/40 (92%), Positives = 39/40 (97%)

Query: 1 KTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQS 40  
KTG+DNGKGVSTTINGEKVTLTVADIA+ ATDVNAATLQS  
Sbjct: 288 KTGNDGNGKVSTTINGEKVTLTVADIAASATDVNAATLQS 327

sp Q06982 Flagellin (Phase-1-C flagellin) [fliC] [Salmonella  
FLIC\_SALRO rostock]

504  
AA  
align

Score = 95.4 bits (219), Expect = 1e-19  
Identities = 37/40 (92%), Positives = 38/40 (94%)

Query: 1 KTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQS 40  
KTGDDGNGKVSTTINGEKVTLTVADI GA+DVNAATLQS  
Sbjct: 287 KTGDDGNGKVSTTINGEKVTLTVADIGIGAADVNAATLQS 326

tr Q66PR4 Phase 1 flagellin [fliC] [Salmonella rostock] 505 AA  
Q66PR4\_SALRO

align

Score = 95.4 bits (219), Expect = 1e-19  
Identities = 37/40 (92%), Positives = 38/40 (94%)

Query: 1 KTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQS 40  
KTGDDGNGKVSTTINGEKVTLTVADI GA+DVNAATLQS  
Sbjct: 288 KTGDDGNGKVSTTINGEKVTLTVADIGIGAADVNAATLQS 327

tr Q6V2V1 Phase 1 flagellin [fliC] [Salmonella enterica] 505 AA  
Q6V2V1\_9ENTR

align

Score = 95.4 bits (219), Expect = 1e-19  
Identities = 37/40 (92%), Positives = 38/40 (94%)

Query: 1 KTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQS 40  
KTGDDGNGKVSTTINGEKVTLTVADI GA+DVNAATLQS  
Sbjct: 288 KTGDDGNGKVSTTINGEKVTLTVADIGIGAADVNAATLQS 327

align

align

align

align

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Search  for

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Welcome to the SIB BLAST Network Service

If results of this search are reported or published, please mention that the computation was performed at the SIB using the BLAST network service. The SIB BLAST network service uses a server developed at SIB and the NCBI BLAST 2 software.

In case of problems, please read the [online BLAST help](#).  
If your question is not covered, please contact [<helpdesk@expasy.org>](mailto:helpdesk@expasy.org).

NCBI BLAST program reference [PMID:9254694]:

Altschul S.F., Madden T.L., Schäffer A.A., Zhang J., Zhang Z., Miller W., Lipman D.J. Gapped BLAST and PSI-BLAST: a new generation of protein database search programs. Nucleic Acids Res. 25:3389-3402(1997).

=====

Query: 27 AA

Date run: 2005-07-06 11:59:07 UTC+0100 on sib-gml.unil.ch

Program: NCBI BLASTP 1.5.4-Paracel [2003-06-05]

Database: EXPASY/UniProtKB

2,035,690 sequences; 659,769,346 total letters

UniProt Knowledgebase Release 5.4 consists of:

UniProtKB/Swiss-Prot Release 47.4 of 05-Jul-2005: 186882 entries

UniProtKB/TrEMBL Release 30.4 of 05-Jul-2005: 1837312 entries

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#### List of potentially matching sequences

Send selected sequences to

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Db	AC	Description	Score	E-value
<input type="checkbox"/>	sp	<a href="#">Q06973</a> FLIC_SALMO Flagellin (Phase-1-C flagellin) [fliC] [Sal...	83	6e-16
<input type="checkbox"/>	sp	<a href="#">Q06972</a> FLIC_SALEN Flagellin (Phase-1-C flagellin) [fliC] [Sal...	83	6e-16
<input type="checkbox"/>	tr	<a href="#">Q53WZ9</a> _SALEN Phase 1 flagellin [fliC] [Salmonella enteritidis]	83	6e-16
<input type="checkbox"/>	tr	<a href="#">Q6V2W5</a> _9ENTR Phase 1 flagellin [fliC] [Salmonella enterica]	83	6e-16
<input type="checkbox"/>	tr	<a href="#">Q6V2V9</a> _9ENTR Phase 1 flagellin [fliC] [Salmonella enterica]	83	6e-16
<input type="checkbox"/>	tr	<a href="#">Q66PR7</a> _SALMO Phase 1 flagellin [fliC] [Salmonella montevideo]	83	6e-16
<input type="checkbox"/>	tr	<a href="#">Q6LDG7</a> _SALGL Phase-1 flagellin [fliC1] [Salmonella gallinarum]	83	6e-16
<input type="checkbox"/>	tr	<a href="#">Q6LDG6</a> _SALET Phase-1 flagellin [fliC1] [Salmonella enterica s...]	83	6e-16
<input type="checkbox"/>	tr	<a href="#">Q66PR6</a> _SALET Phase 1 flagellin [fliC] [Salmonella enterica su...]	83	6e-16


<input type="checkbox"/>	tr	<u>Q66PN4</u>	_SALET Phase 1 flagellin [fliC] [Salmonella enterica su...	<u>83</u>	6e-16
<input type="checkbox"/>	tr	<u>Q66PN3</u>	_SALET Phase 1 flagellin [fliC] [Salmonella enterica su...	<u>83</u>	6e-16
<input type="checkbox"/>	tr	<u>Q54864</u>	_SALPU Phase-1 flagellin [fliC] [Salmonella pullorum]	<u>83</u>	6e-16
<input type="checkbox"/>	tr	<u>Q54863</u>	_SALPU Phase-1 flagellin [fliC] [Salmonella pullorum]	<u>83</u>	6e-16
<input type="checkbox"/>	tr	<u>Q54329</u>	_SALET Phase-1 flagellin (Fragment) [fliC] [Salmonella ...	<u>83</u>	6e-16
<input type="checkbox"/>	tr	<u>Q54210</u>	_SALGL Phase-1 flagellin [fliC1] [Salmonella gallinarum]	<u>83</u>	6e-16
<input type="checkbox"/>	tr	<u>Q53998</u>	_SALEN Phase-1 flagellin (Fragment) [fliC] [Salmonella ...	<u>83</u>	6e-16
<input type="checkbox"/>	tr	<u>Q53989</u>	_SALET Phase-1 flagellin (Fragment) [fliC] [Salmonella ...	<u>83</u>	6e-16
<input type="checkbox"/>	tr	<u>Q53967</u>	_SALET Phase-1 flagellin (Fragment) [fliC] [Salmonella ...	<u>83</u>	6e-16
<input type="checkbox"/>	tr	<u>Q53822</u>	_SALET Phase-1 flagellin (Fragment) [fliC] [Salmonella ...	<u>83</u>	6e-16
<input type="checkbox"/>	tr	<u>Q53993</u>	_9ENTR Phase 1 flagellin [fliC] [Salmonella enterica]	<u>80</u>	5e-15
<input type="checkbox"/>	tr	<u>Q53970</u>	_SALDU Phase-1 flagellin [fliC1] [Salmonella dublin]	<u>80</u>	5e-15
<input type="checkbox"/>	sp	<u>Q06981</u>	FLIC_SALMC Flagellin (Phase-1-D flagellin) [fliC] [Sal...	<u>80</u>	6e-15
<input type="checkbox"/>	tr	<u>Q79DB7</u>	_SALET Phase 1 flagellin [fliC] [Salmonella enterica su...	<u>80</u>	6e-15
<input type="checkbox"/>	tr	<u>Q66PR2</u>	_SALMC Phase 1 flagellin [fliC] [Salmonella moscow]	<u>80</u>	6e-15
<input type="checkbox"/>	tr	<u>Q6V2V0</u>	_9ENTR Phase 1 flagellin [fliC] [Salmonella enterica]	<u>80</u>	6e-15
<input type="checkbox"/>	tr	<u>Q6V2U9</u>	_9ENTR Phase 1 flagellin [fliC] [Salmonella enterica]	<u>80</u>	6e-15
<input type="checkbox"/>	tr	<u>Q57381</u>	_SALEN Phase-1 flagellin [fliC1] [Salmonella enteritidis]	<u>80</u>	6e-15
<input type="checkbox"/>	tr	<u>Q6V2W1</u>	_9ENTR Phase 1 flagellin [fliC] [Salmonella enterica]	<u>79</u>	9e-15
<input type="checkbox"/>	sp	<u>Q52959</u>	FLIC_SALNA Phase-1 flagellin [fliC] [Salmonella naestved]	<u>76</u>	7e-14
<input type="checkbox"/>	sp	<u>Q06971</u>	FLIC_SALDU Flagellin (Phase-1-C flagellin) [fliC] [Sal...	<u>76</u>	7e-14
<input type="checkbox"/>	tr	<u>Q6V2V3</u>	_9ENTR Phase 1 flagellin [fliC] [Salmonella enterica]	<u>76</u>	7e-14
<input type="checkbox"/>	tr	<u>Q66PR3</u>	_SALDU Phase 1 flagellin [fliC] [Salmonella dublin]	<u>76</u>	7e-14
<input type="checkbox"/>	tr	<u>Q6V2V5</u>	_9ENTR Phase 1 flagellin [fliC] [Salmonella enterica]	<u>76</u>	7e-14
<input type="checkbox"/>	tr	<u>Q6V2V2</u>	_9ENTR Phase 1 flagellin [fliC] [Salmonella enterica]	<u>76</u>	7e-14
<input type="checkbox"/>	tr	<u>Q66PR5</u>	_SALNA Phase 1 flagellin [fliC] [Salmonella naestved]	<u>76</u>	7e-14
<input type="checkbox"/>	sp	<u>Q06968</u>	FLIC_SALBE Flagellin (Phase-1-I flagellin) [fliC] [Sal...	<u>74</u>	4e-13
<input type="checkbox"/>	tr	<u>Q6V2H1</u>	_9ENTR Phase 1 flagellin [fliC] [Salmonella enterica]	<u>74</u>	4e-13
<input type="checkbox"/>	tr	<u>Q53583</u>	_SALET Phase-1 flagellin (Fragment) [fliC] [Salmonella ...	<u>74</u>	4e-13
<input type="checkbox"/>	sp	<u>Q06982</u>	FLIC_SALRO Flagellin (Phase-1-C flagellin) [fliC] [Sal...	<u>73</u>	7e-13
<input type="checkbox"/>	tr	<u>Q53992</u>	_9ENTR Phase 1 flagellin [fliC] [Salmonella enterica]	<u>73</u>	7e-13
<input type="checkbox"/>	tr	<u>Q53991</u>	_9ENTR Phase 1 flagellin [fliC] [Salmonella enterica]	<u>73</u>	7e-13
<input type="checkbox"/>	tr	<u>Q66PR4</u>	_SALRO Phase 1 flagellin [fliC] [Salmonella rostock]	<u>73</u>	7e-13
<input type="checkbox"/>	tr	<u>Q6V2V1</u>	_9ENTR Phase 1 flagellin [fliC] [Salmonella enterica]	<u>73</u>	7e-13
<input type="checkbox"/>	tr	<u>Q66PQ9</u>	_9ENTR Phase 1 flagellin [fliC] [Salmonella enterica su...	<u>73</u>	7e-13
<input type="checkbox"/>	tr	<u>Q66PQ8</u>	_SALEE Phase 1 flagellin [fliC] [Salmonella enterica VI...	<u>73</u>	7e-13
<input type="checkbox"/>	tr	<u>Q53996</u>	_9ENTR Phase 1 flagellin [fliC] [Salmonella enterica]	<u>73</u>	7e-13
<input type="checkbox"/>	sp	<u>Q06970</u>	FLIC_SALDE Flagellin (Phase-1-C flagellin) [fliC] [Sal...	<u>71</u>	2e-12
<input type="checkbox"/>	tr	<u>Q6V2X1</u>	_9ENTR Phase 1 flagellin [fliC] [Salmonella enterica]	<u>71</u>	2e-12
<input type="checkbox"/>	tr	<u>Q66PR8</u>	_SALDE Phase 1 flagellin [fliC] [Salmonella derby]	<u>71</u>	2e-12
<input type="checkbox"/>	tr	<u>Q6V2W8</u>	_9ENTR Phase 1 flagellin [fliC] [Salmonella enterica]	<u>71</u>	2e-12
<input type="checkbox"/>	tr	<u>Q66PS0</u>	_SALET Phase 1 flagellin [fliC] [Salmonella enterica su...	<u>71</u>	2e-12
<input type="checkbox"/>	tr	<u>Q9R406</u>	_SALPU Phase 1 flagellin C (Fragment) [fliC] [Salmonell...	<u>71</u>	2e-12
<input type="checkbox"/>	tr	<u>Q9R405</u>	_SALGL Phase 1 flagellin C (Fragment) [fliC] [Salmonell...	<u>71</u>	2e-12
<input type="checkbox"/>	tr	<u>Q9R2V0</u>	_SALPU Phase 1 flagellin C (Fragment) [fliC] [Salmonell...	<u>71</u>	2e-12


<input type="checkbox"/>	tr	<a href="#">Q53995</a>	_9ENTR	Phase 1 flagellin [fliC]	[Salmonella enterica]	<a href="#">71</a>	3e-12
<input type="checkbox"/>	sp	<a href="#">Q06983</a>	FLIC_SALSE	Flagellin (Phase-1-C flagellin) [fliC]	[Sal...	<a href="#">69</a>	7e-12
<input type="checkbox"/>	sp	<a href="#">Q06969</a>	FLIC_SALBU	Flagellin (Phase-1-C flagellin) [fliC]	[Sal...	<a href="#">69</a>	7e-12
<input type="checkbox"/>	tr	<a href="#">Q66PR0</a>	_SALBU	Phase 1 flagellin [fliC]	[Salmonella budapest]	<a href="#">69</a>	7e-12
<input type="checkbox"/>	tr	<a href="#">Q6V2U7</a>	_9ENTR	Phase 1 flagellin [fliC]	[Salmonella enterica]	<a href="#">69</a>	7e-12
<input type="checkbox"/>	tr	<a href="#">Q6V2U6</a>	_9ENTR	Phase 1 flagellin [fliC]	[Salmonella enterica]	<a href="#">69</a>	7e-12
<input type="checkbox"/>	tr	<a href="#">Q6V2G9</a>	_9ENTR	Phase 1 flagellin [fliC]	[Salmonella enterica]	<a href="#">69</a>	7e-12
<input type="checkbox"/>	tr	<a href="#">Q6LD27</a>	_SALET	Phase-1 flagellin (Fragment) [fliC]	[Salmonella ...]	<a href="#">69</a>	7e-12
<input type="checkbox"/>	tr	<a href="#">Q66PR9</a>	_9ENTR	Phase 1 flagellin [fliC]	[Salmonella enterica su...]	<a href="#">69</a>	7e-12
<input type="checkbox"/>	tr	<a href="#">Q66PR1</a>	_SALSE	Phase 1 flagellin [fliC]	[Salmonella senftenberg]	<a href="#">69</a>	7e-12
<input type="checkbox"/>	tr	<a href="#">Q53990</a>	_9ENTR	Phase 1 flagellin [fliC]	[Salmonella enterica]	<a href="#">69</a>	7e-12
<input type="checkbox"/>	tr	<a href="#">Q54489</a>	_SALET	Phase 1 flagellin [fliC]	[Salmonella enterica su...]	<a href="#">68</a>	2e-11
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<input type="checkbox"/>	tr	<a href="#">Q6V2V7</a>	_9ENTR	Phase 1 flagellin [fliC]	[Salmonella enterica]	<a href="#">68</a>	2e-11
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<input type="checkbox"/>	tr	<a href="#">Q6V2X0</a>	_9ENTR	Phase 1 flagellin [fliC]	[Salmonella enterica]	<a href="#">67</a>	3e-11
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<input type="checkbox"/>	tr	<a href="#">Q53994</a>	_9ENTR	Phase 1 flagellin [fliC]	[Salmonella enterica]	<a href="#">65</a>	1e-10
<input type="checkbox"/>	tr	<a href="#">Q54414</a>	_SALET	Phase-1 flagellin (Fragment) [fliC]	[Salmonella ...]	<a href="#">65</a>	2e-10
<input type="checkbox"/>	tr	<a href="#">Q54515</a>	_SALET	Phase 1 flagellin [fliC]	[Salmonella enterica su...]	<a href="#">64</a>	3e-10
<input type="checkbox"/>	tr	<a href="#">Q6V2U4</a>	_9ENTR	Phase 1 flagellin [fliC]	[Salmonella enterica]	<a href="#">64</a>	3e-10
<input type="checkbox"/>	sp	<a href="#">Q06974</a>	FLIC_SALON	Flagellin (Phase-1-C flagellin) [fliC]	[Sal...	<a href="#">64</a>	3e-10
<input type="checkbox"/>	tr	<a href="#">Q6V2U1</a>	_9ENTR	Phase 1 flagellin [fliC]	[Salmonella enterica]	<a href="#">64</a>	3e-10
<input type="checkbox"/>	tr	<a href="#">Q6LD24</a>	_SALET	Phase 1 flagellin [fliC]	[Salmonella enterica su...]	<a href="#">64</a>	3e-10
<input type="checkbox"/>	tr	<a href="#">Q54415</a>	_SALET	Phase-1 flagellin (Fragment) [fliC]	[Salmonella ...]	<a href="#">64</a>	3e-10
<input type="checkbox"/>	tr	<a href="#">Q53821</a>	_SALET	Phase-1 flagellin (Fragment) [fliC]	[Salmonella ...]	<a href="#">64</a>	3e-10
<input type="checkbox"/>	tr	<a href="#">Q6V2U3</a>	_9ENTR	Phase 1 flagellin [fliC]	[Salmonella enterica]	<a href="#">63</a>	5e-10
<input type="checkbox"/>	tr	<a href="#">Q5G1R0</a>	_SALGL	FliC (Fragment) [fliC]	[Salmonella gallinarum]	<a href="#">57</a>	5e-08
<input type="checkbox"/>	tr	<a href="#">Q5G1Q9</a>	_SALPU	FliC (Fragment) [fliC]	[Salmonella pullorum]	<a href="#">44</a>	3e-04
<input type="checkbox"/>	tr	<a href="#">Q8Y5E5</a>	_LISMO	Lmo2119 protein [lmo2119]	[Listeria monocytogenes]	<a href="#">32</a>	1.3
<input type="checkbox"/>	tr	<a href="#">Q71XP4</a>	_LISMF	Hypothetical protein [LMOF2365_2152]	[Listeria m...]	<a href="#">32</a>	1.3
<input type="checkbox"/>	tr	<a href="#">Q64XJ1</a>	_BACFR	Thioredoxin reductase [BF1035]	[Bacteroides frag...]	<a href="#">32</a>	1.3
<input type="checkbox"/>	tr	<a href="#">Q5LGP4</a>	_BACFR	Putative thioredoxin reductase (EC 1.8.1.9)	[trx...]	<a href="#">32</a>	1.3
<input type="checkbox"/>	tr	<a href="#">Q929Q0</a>	_LISIN	Lin2224 protein [lin2224]	[Listeria innocua]	<a href="#">31</a>	3.1
<input type="checkbox"/>	tr	<a href="#">Q9AH56</a>	_NEIME	Exl2 [exl2]	[Neisseria meningitidis]	<a href="#">29</a>	7.5

## Graphical overview of the alignments

[Click here](#) to resubmit your query after masking regions matching [PROSITE](#) profiles or [Pfam](#) HMMs

([Help](#)) (use [ScanProsite](#) for more details about PROSITE matches)

**Profile hits** 

**Pfam hits** 

Submission	Matches on query sequence	Mat
1		1
FLIC_SALMO		
FLIC_SALEN		
Q53M29		
Q6V2M5		
Q6V2V9		
Q66PR7		
Q6LDG7		
Q6LDG6		
Q66PR6		
Q66PN4		
Q66PN3		
Q54864		
Q54863		
Q54329		
Q54210		
Q53998		
Q53989		
Q53967		
Q53822		
Q53993		
Q53970		
FLIC_SALMC		
Q79DB7		
Q66PR2		
Q6V2V0		
Q6V2U9		
Q57381		
Q6V2M1		
FLIC_SALNA		
FLIC_SALDU		
Q6V2V3		
Q66PR3		
Q6V2V5		
Q6V2V2		
Q66PR5		
FLIC_SALBE		
Q6V2H1		
Q53583		
FLIC_SALRO		
Q53992		
Q53991		
Q66PR4		
Q6V2V1		
Q66PQ9		
Q66PQ8		
Q53996		
FLIC_SALDE		
Q6V2X1		
Q66PR8		
Q6V2M8		
Q66PS0		
Q9R406		
Q9R405		
Q9R2V0		
Q53995		
FLIC_SALSE		
FLIC_SALBU		
Q66PR0		
Q6V2U7		
Q6V2U6		
Q6V2G9		
Q6LD27		
Q66PR9		
Q66PR1		
Q53990		
Q54489		
Q6V2U0		
Q6V2V7		
Q6V2G8		
Q6V2X0		
Q6V2T7		
Q6V2G7		
Q53994		
Q54414		
Q54515		
Q6V2U4		
FLIC_SALON		
Q6V2U1		
Q6LD24		
Q54415		
Q53821		
Q6V2U3		
Q5G1R0		
Q5G1Q9		
Q8Y5E5		
Q71XP4		

## Alignments

sp Q06973 Flagellin (Phase-1-C flagellin) [fliC] [Salmonella] 504  
FLIC\_SALMO montevideo] AA  
[align](#)

Score = 82.9 bits (188), Expect = 6e-16  
Identities = 27/27 (100%), Positives = 27/27 (100%)

Query: 1 DGNGKVSTTINGEKVTLTVADIATGAT 27  
DGNGKVSTTINGEKVTLTVADIATGAT  
Sbjct: 291 DGNGKVSTTINGEKVTLTVADIATGAT 317

sp Q06972 Flagellin (Phase-1-C flagellin) [fliC] [Salmonella] 504  
FLIC\_SALEN enteritidis] AA  
[align](#)

Score = 82.9 bits (188), Expect = 6e-16  
Identities = 27/27 (100%), Positives = 27/27 (100%)

Query: 1 DGNGKVSTTINGEKVTLTVADIATGAT 27  
DGNGKVSTTINGEKVTLTVADIATGAT  
Sbjct: 291 DGNGKVSTTINGEKVTLTVADIATGAT 317

tr Q53WZ9 Phase 1 flagellin [fliC] [Salmonella enteritidis] 505 AA  
Q53WZ9\_SALEN  
[align](#)

Score = 82.9 bits (188), Expect = 6e-16  
Identities = 27/27 (100%), Positives = 27/27 (100%)

Query: 1 DGNGKVSTTINGEKVTLTVADIATGAT 27  
DGNGKVSTTINGEKVTLTVADIATGAT  
Sbjct: 292 DGNGKVSTTINGEKVTLTVADIATGAT 318

tr Q6V2W5 Phase 1 flagellin [fliC] [Salmonella enterica] 505 AA  
Q6V2W5\_9ENTR  
[align](#)

Score = 82.9 bits (188), Expect = 6e-16  
Identities = 27/27 (100%), Positives = 27/27 (100%)

Query: 1 DGNGKVSTTINGEKVTLTVADIATGAT 27  
DGNGKVSTTINGEKVTLTVADIATGAT  
Sbjct: 292 DGNGKVSTTINGEKVTLTVADIATGAT 318

tr Q6V2V9 Phase 1 flagellin [fliC] [Salmonella enterica] 505 AA  
Q6V2V9\_9ENTR  
align

Score = 82.9 bits (188), Expect = 6e-16  
Identities = 27/27 (100%), Positives = 27/27 (100%)

Query: 1 DGNGKVSTTINGEKVTLTVADIATGAT 27  
DGNGKVSTTINGEKVTLTVADIATGAT  
Sbjct: 292 DGNGKVSTTINGEKVTLTVADIATGAT 318

tr Q66PR7 Phase 1 flagellin [fliC] [Salmonella montevideo] 505 AA  
Q66PR7\_SALMO  
align

Score = 82.9 bits (188), Expect = 6e-16  
Identities = 27/27 (100%), Positives = 27/27 (100%)

Query: 1 DGNGKVSTTINGEKVTLTVADIATGAT 27  
DGNGKVSTTINGEKVTLTVADIATGAT  
Sbjct: 292 DGNGKVSTTINGEKVTLTVADIATGAT 318

tr Q6LDG7 Phase-1 flagellin [fliC1] [Salmonella gallinarum] 505 AA  
Q6LDG7\_SALGL  
align

Score = 82.9 bits (188), Expect = 6e-16  
Identities = 27/27 (100%), Positives = 27/27 (100%)

Query: 1 DGNGKVSTTINGEKVTLTVADIATGAT 27  
DGNGKVSTTINGEKVTLTVADIATGAT  
Sbjct: 292 DGNGKVSTTINGEKVTLTVADIATGAT 318

tr Q6LDG6 Phase-1 flagellin [fliC1] [Salmonella enterica subsp. 505  
Q6LDG6\_SALET enterica AA  
serovar Gallinarum/pullorum] align

Score = 82.9 bits (188), Expect = 6e-16  
Identities = 27/27 (100%), Positives = 27/27 (100%)

Query: 1 DGNGKVSTTINGEKVTLTVADIATGAT 27  
DGNGKVSTTINGEKVTLTVADIATGAT  
Sbjct: 292 DGNGKVSTTINGEKVTLTVADIATGAT 318

tr Q66PR6 Phase 1 flagellin [fliC] [Salmonella enterica subsp. 505  
Q66PR6\_SALET enterica AA  
serovar Enteritidis] align

Score = 82.9 bits (188), Expect = 6e-16  
Identities = 27/27 (100%), Positives = 27/27 (100%)

Query: 1 DGNGKVSTTINGEKVTLTVADIATGAT 27  
          DGNGKVSTTINGEKVTLTVADIATGAT  
Sbjct: 292 DGNGKVSTTINGEKVTLTVADIATGAT 318

tr Q66PN4           Phase 1 flagellin [fliC] [Salmonella enterica subsp.       505  
    Q66PN4\_SALET enterica                                                   AA  
                  serovar Emek]                                           align

Score = 82.9 bits (188), Expect = 6e-16  
Identities = 27/27 (100%), Positives = 27/27 (100%)

Query: 1 DGNGKVSTTINGEKVTLTVADIATGAT 27  
          DGNGKVSTTINGEKVTLTVADIATGAT  
Sbjct: 292 DGNGKVSTTINGEKVTLTVADIATGAT 318

tr Q66PN3           Phase 1 flagellin [fliC] [Salmonella enterica subsp.       505  
    Q66PN3\_SALET enterica                                                   AA  
                  serovar Enteritidis]                                   align

Score = 82.9 bits (188), Expect = 6e-16  
Identities = 27/27 (100%), Positives = 27/27 (100%)

Query: 1 DGNGKVSTTINGEKVTLTVADIATGAT 27  
          DGNGKVSTTINGEKVTLTVADIATGAT  
Sbjct: 292 DGNGKVSTTINGEKVTLTVADIATGAT 318

tr Q54864           Phase-1 flagellin [fliC] [Salmonella pullorum] 505 AA  
    Q54864\_SALPU                                                           align

Score = 82.9 bits (188), Expect = 6e-16  
Identities = 27/27 (100%), Positives = 27/27 (100%)

Query: 1 DGNGKVSTTINGEKVTLTVADIATGAT 27  
          DGNGKVSTTINGEKVTLTVADIATGAT  
Sbjct: 292 DGNGKVSTTINGEKVTLTVADIATGAT 318

tr Q54863           Phase-1 flagellin [fliC] [Salmonella pullorum] 505 AA  
    Q54863\_SALPU                                                           align

Score = 82.9 bits (188), Expect = 6e-16  
Identities = 27/27 (100%), Positives = 27/27 (100%)

Query: 1 DGNGKVSTTINGEKVTLTVADIATGAT 27  
DGNGKVSTTINGEKVTLTVADIATGAT  
Sbjct: 292 DGNGKVSTTINGEKVTLTVADIATGAT 318

tr Q54329 Phase-1 flagellin (Fragment) [fliC] [Salmonella enterica 504  
Q54329\_SALET subsp. AA  
enterica serovar Enteritidis var. jena] align

Score = 82.9 bits (188), Expect = 6e-16  
Identities = 27/27 (100%), Positives = 27/27 (100%)

Query: 1 DGNGKVSTTINGEKVTLTVADIATGAT 27  
DGNGKVSTTINGEKVTLTVADIATGAT  
Sbjct: 291 DGNGKVSTTINGEKVTLTVADIATGAT 317

tr Q54210 Phase-1 flagellin [fliC1] [Salmonella gallinarum] 494 AA  
Q54210\_SALGL align

Score = 82.9 bits (188), Expect = 6e-16  
Identities = 27/27 (100%), Positives = 27/27 (100%)

Query: 1 DGNGKVSTTINGEKVTLTVADIATGAT 27  
DGNGKVSTTINGEKVTLTVADIATGAT  
Sbjct: 292 DGNGKVSTTINGEKVTLTVADIATGAT 318

tr Q53998 Phase-1 flagellin (Fragment) [fliC] [Salmonella 493  
Q53998\_SALEN enteritidis] AA  
align

Score = 82.9 bits (188), Expect = 6e-16  
Identities = 27/27 (100%), Positives = 27/27 (100%)

Query: 1 DGNGKVSTTINGEKVTLTVADIATGAT 27  
DGNGKVSTTINGEKVTLTVADIATGAT  
Sbjct: 280 DGNGKVSTTINGEKVTLTVADIATGAT 306

tr Q53989 Phase-1 flagellin (Fragment) [fliC] [Salmonella enterica 504  
Q53989\_SALET subsp. AA  
enterica serovar Essen] align

Score = 82.9 bits (188), Expect = 6e-16  
Identities = 27/27 (100%), Positives = 27/27 (100%)

Query: 1 DGNGKVSTTINGEKVTLTVADIATGAT 27  
DGNGKVSTTINGEKVTLTVADIATGAT  
Sbjct: 291 DGNGKVSTTINGEKVTLTVADIATGAT 317

tr Q53967 Phase-1 flagellin (Fragment) [fliC] [Salmonella enterica] 465  
Q53967\_SALET subsp. AA  
enterica serovar Enteritidis var. danysz] [align](#)

Score = 82.9 bits (188), Expect = 6e-16  
Identities = 27/27 (100%), Positives = 27/27 (100%)

Query: 1 DGNGKVSTTINGEKVTLTVADIATGAT 27  
DGNGKVSTTINGEKVTLTVADIATGAT  
Sbjct: 291 DGNGKVSTTINGEKVTLTVADIATGAT 317

tr Q53822 Phase-1 flagellin (Fragment) [fliC] [Salmonella enterica] 504  
Q53822\_SALET subsp. AA  
enterica serovar Enteritidis var. chaco] [align](#)

Score = 82.9 bits (188), Expect = 6e-16  
Identities = 27/27 (100%), Positives = 27/27 (100%)

Query: 1 DGNGKVSTTINGEKVTLTVADIATGAT 27  
DGNGKVSTTINGEKVTLTVADIATGAT  
Sbjct: 291 DGNGKVSTTINGEKVTLTVADIATGAT 317

tr Q53993 Phase 1 flagellin [fliC] [Salmonella enterica] 508 AA  
Q53993\_9ENTR [align](#)

Score = 80.0 bits (181), Expect = 5e-15  
Identities = 26/27 (96%), Positives = 26/27 (96%)

Query: 1 DGNGKVSTTINGEKVTLTVADIATGAT 27  
DGNGKVSTTINGEKVTLTVADIATGAT  
Sbjct: 295 DGNGKVSTTINGEKVTLTVADIATGAT 321

tr Q53970 Phase-1 flagellin [fliC1] [Salmonella dublin] 505 AA  
Q53970\_SALDU [align](#)

Score = 80.0 bits (181), Expect = 5e-15  
Identities = 26/26 (100%), Positives = 26/26 (100%)

Query: 1 DGNGKVSTTINGEKVTLTVADIATGA 26  
DGNGKVSTTINGEKVTLTVADIATGA  
Sbjct: 292 DGNGKVSTTINGEKVTLTVADIATGA 317

sp Q06981 Flagellin (Phase-1-D flagellin) [fliC] [Salmonella moscow] 504 AA  
FLIC\_SALMC

[align](#)

Score = 79.5 bits (180), Expect = 6e-15  
Identities = 26/26 (100%), Positives = 26/26 (100%)

Query: 2 GNGKVSTTINGEKVTLTVADIATGAT 27  
GNGKVSTTINGEKVTLTVADIATGAT  
Sbjct: 292 GNGKVSTTINGEKVTLTVADIATGAT 317

tr Q79DB7 Phase 1 flagellin [fliC] [Salmonella enterica subsp. 505  
Q79DB7\_SALET enterica AA  
serovar Othmarschen] [align](#)

Score = 79.5 bits (180), Expect = 6e-15  
Identities = 26/27 (96%), Positives = 26/27 (96%)

Query: 1 DGNGKVSTTINGEKVTLTVADIATGAT 27  
DGNGKVSTTINGEKVTLTVADIAT AT  
Sbjct: 292 DGNGKVSTTINGEKVTLTVADIATSAT 318

tr Q66PR2 Phase 1 flagellin [fliC] [Salmonella moscow] 505 AA  
Q66PR2\_SALMC [align](#)

Score = 79.5 bits (180), Expect = 6e-15  
Identities = 26/26 (100%), Positives = 26/26 (100%)

Query: 2 GNGKVSTTINGEKVTLTVADIATGAT 27  
GNGKVSTTINGEKVTLTVADIATGAT  
Sbjct: 293 GNGKVSTTINGEKVTLTVADIATGAT 318

tr Q6V2V0 Phase 1 flagellin [fliC] [Salmonella enterica] 505 AA  
Q6V2V0\_9ENTR [align](#)

Score = 79.5 bits (180), Expect = 6e-15  
Identities = 26/26 (100%), Positives = 26/26 (100%)

Query: 2 GNGKVSTTINGEKVTLTVADIATGAT 27  
GNGKVSTTINGEKVTLTVADIATGAT  
Sbjct: 293 GNGKVSTTINGEKVTLTVADIATGAT 318

tr Q6V2U9 Phase 1 flagellin [fliC] [Salmonella enterica] 505 AA  
Q6V2U9\_9ENTR [align](#)

Score = 79.5 bits (180), Expect = 6e-15  
Identities = 26/26 (100%), Positives = 26/26 (100%)

Query: 2 GNGKVSTTINGEKVTLTVADIATGAT 27  
GNGKVSTTINGEKVTLTVADIATGAT  
Sbjct: 293 GNGKVSTTINGEKVTLTVADIATGAT 318

tr Q57381 Phase-1 flagellin [fliC1] [Salmonella enteritidis] 505 AA  
Q57381\_SALEN

[align](#)

Score = 79.5 bits (180), Expect = 6e-15  
Identities = 26/27 (96%), Positives = 26/27 (96%)

Query: 1 DGNGKVSTTINGEKVTLTVADIATGAT 27  
DGNGKVSTTINGEKVTLTVADIAT AT  
Sbjct: 292 DGNGKVSTTINGEKVTLTVADIATSAT 318

tr Q6V2W1 Phase 1 flagellin [fliC] [Salmonella enterica] 505 AA  
Q6V2W1\_9ENTR

[align](#)

Score = 79.1 bits (179), Expect = 9e-15  
Identities = 26/27 (96%), Positives = 26/27 (96%)

Query: 1 DGNGKVSTTINGEKVTLTVADIATGAT 27  
DGNGKVSTTINGEKVTLTVADIA GAT  
Sbjct: 292 DGNGKVSTTINGEKVTLTVADIAIGAT 318

sp O52959 Phase-1 flagellin [fliC] [Salmonella naestved] 504 AA  
FLIC\_SALNA

[align](#)

Score = 76.1 bits (172), Expect = 7e-14  
Identities = 25/26 (96%), Positives = 25/26 (96%)

Query: 1 DGNGKVSTTINGEKVTLTVADIATGA 26  
DGNGKVSTTINGEKVTLTVADIA GA  
Sbjct: 291 DGNGKVSTTINGEKVTLTVADIAIGA 316

sp Q06971 Flagellin (Phase-1-C flagellin) [fliC] [Salmonella dublin] 504 AA  
FLIC\_SALDU

[align](#)

Score = 76.1 bits (172), Expect = 7e-14  
Identities = 25/26 (96%), Positives = 25/26 (96%)

Query: 1 DGNGKVSTTINGEKVTLTVADIATGA 26  
DGNGKVSTTINGEKVTLTVADIA GA  
Sbjct: 291 DGNGKVSTTINGEKVTLTVADIAIGA 316

tr Q6V2V3 Phase 1 flagellin [fliC] [Salmonella enterica] 505 AA  
Q6V2V3\_9ENTR  
align

Score = 76.1 bits (172), Expect = 7e-14  
Identities = 25/26 (96%), Positives = 25/26 (96%)

Query: 1 DGNGKVSTTINGEKVTLTVADIATGA 26  
DGNGKVSTTINGEKVTLTVADIA GA  
Sbjct: 292 DGNGKVSTTINGEKVTLTVADIAIGA 317

tr Q66PR3 Phase 1 flagellin [fliC] [Salmonella dublin] 505 AA  
Q66PR3\_SALDU  
align

Score = 76.1 bits (172), Expect = 7e-14  
Identities = 25/26 (96%), Positives = 25/26 (96%)

Query: 1 DGNGKVSTTINGEKVTLTVADIATGA 26  
DGNGKVSTTINGEKVTLTVADIA GA  
Sbjct: 292 DGNGKVSTTINGEKVTLTVADIAIGA 317

tr Q6V2V5 Phase 1 flagellin [fliC] [Salmonella enterica] 505 AA  
Q6V2V5\_9ENTR  
align

Score = 76.1 bits (172), Expect = 7e-14  
Identities = 25/27 (92%), Positives = 25/27 (92%)

Query: 1 DGNGKVSTTINGEKVTLTVADIATGAT 27  
DGNGKVSTTINGEKVTLTVADIA AT  
Sbjct: 292 DGNGKVSTTINGEKVTLTVADIAASAT 318

tr Q6V2V2 Phase 1 flagellin [fliC] [Salmonella enterica] 505 AA  
Q6V2V2\_9ENTR  
align

Score = 76.1 bits (172), Expect = 7e-14  
Identities = 25/26 (96%), Positives = 25/26 (96%)

Query: 1 DGNGKVSTTINGEKVTLTVADIATGA 26  
DGNGKVSTTINGEKVTLTVADIA GA  
Sbjct: 292 DGNGKVSTTINGEKVTLTVADIAIGA 317

tr Q66PR5 Phase 1 flagellin [fliC] [Salmonella naestved] 505 AA  
Q66PR5\_SALNA

align

Score = 76.1 bits (172), Expect = 7e-14  
Identities = 25/26 (96%), Positives = 25/26 (96%)

Query: 1 DGNGKVSTTINGEKVTLTVADIATGA 26  
DGNGKVSTTINGEKVTLTVADIA GA  
Sbjct: 292 DGNGKVSTTINGEKVTLTVADIAIGA 317

sp Q06968 Flagellin (Phase-1-I flagellin) [fliC] [Salmonella berta] 507 AA  
FLIC\_SALBE

align

Score = 73.6 bits (166), Expect = 4e-13  
Identities = 24/26 (92%), Positives = 24/26 (92%)

Query: 1 DGNGKVSTTINGEKVTLTVADIATGA 26  
DGNGKVSTTINGEKVTLTVADI GA  
Sbjct: 294 DGNGKVSTTINGEKVTLTVADITAGA 319

tr Q6V2H1 Phase 1 flagellin [fliC] [Salmonella enterica] 508 AA  
Q6V2H1\_9ENTR

align

Score = 73.6 bits (166), Expect = 4e-13  
Identities = 24/26 (92%), Positives = 24/26 (92%)

Query: 1 DGNGKVSTTINGEKVTLTVADIATGA 26  
DGNGKVSTTINGEKVTLTVADI GA  
Sbjct: 295 DGNGKVSTTINGEKVTLTVADITAGA 320

tr Q53583 Phase-1 flagellin (Fragment) [fliC] [Salmonella enterica] 504  
Q53583\_SALET subsp.  
enterica serovar Adelaide] AA

align

Score = 73.6 bits (166), Expect = 4e-13  
Identities = 24/26 (92%), Positives = 24/26 (92%)

Query: 1 DGNGKVSTTINGEKVTLTVADIATGA 26  
DGNGKVSTTINGEKVTLTVADI GA  
Sbjct: 291 DGNGKVSTTINGEKVTLTVADITAGA 316

sp Q06982 Flagellin (Phase-1-C flagellin) [fliC] [Salmonella  
FLIC\_SALRO rostock]

504  
AA  
align

Score = 72.7 bits (164), Expect = 7e-13  
Identities = 24/26 (92%), Positives = 24/26 (92%)

Query: 1 DGNGKVSTTINGEKVTLTVADIATGA 26  
          DGNGKVSTTINGEKVTLTVADI GA  
Sbjct: 291 DGNGKVSTTINGEKVTLTVADIGIGA 316

tr Q53992 Phase 1 flagellin [fliC] [Salmonella enterica] 505 AA  
Q53992\_9ENTR

align

Score = 72.7 bits (164), Expect = 7e-13  
Identities = 24/26 (92%), Positives = 24/26 (92%)

Query: 1 DGNGKVSTTINGEKVTLTVADIATGA 26  
          DGNG VSTTINGEKVTLTVADI TGA  
Sbjct: 292 DGNGTVSTTINGEKVTLTVADITTGA 317

tr Q53991 Phase 1 flagellin [fliC] [Salmonella enterica] 504 AA  
Q53991\_9ENTR

align

Score = 72.7 bits (164), Expect = 7e-13  
Identities = 24/26 (92%), Positives = 24/26 (92%)

Query: 1 DGNGKVSTTINGEKVTLTVADIATGA 26  
          DGNG VSTTINGEKVTLTVADI TGA  
Sbjct: 291 DGNGTVSTTINGEKVTLTVADITTGA 316

tr Q66PR4 Phase 1 flagellin [fliC] [Salmonella rostock] 505 AA  
Q66PR4\_SALRO

align

Score = 72.7 bits (164), Expect = 7e-13  
Identities = 24/26 (92%), Positives = 24/26 (92%)

Query: 1 DGNGKVSTTINGEKVTLTVADIATGA 26  
          DGNGKVSTTINGEKVTLTVADI GA  
Sbjct: 292 DGNGKVSTTINGEKVTLTVADIGIGA 317

tr Q6V2V1 Phase 1 flagellin [fliC] [Salmonella enterica] 505 AA  
Q6V2V1\_9ENTR

align

Score = 72.7 bits (164), Expect = 7e-13  
Identities = 24/26 (92%), Positives = 24/26 (92%)

Query: 1 DGNGKVSTTINGEKVTLTVADIATGA 26  
          DGNGKVSTTINGEKVTLTVADI GA  
Sbjct: 292 DGNGKVSTTINGEKVTLTVADIGIGA 317

tr Q66PQ9 Phase 1 flagellin [fliC] [Salmonella enterica subsp. 504  
    Q66PQ9\_9ENTR houtenae AA  
                  serovar 45a,b:g,z51:--] [align](#)

Score = 72.7 bits (164), Expect = 7e-13  
Identities = 24/26 (92%), Positives = 24/26 (92%)

Query: 1 DGNGKVSTTINGEKVTLTVADIATGA 26  
          DGNG VSTTINGEKVTLTVADI TGA  
Sbjct: 291 DGNGTVSTTINGEKVTLTVADITTGA 316

tr Q66PQ8 Phase 1 flagellin [fliC] [Salmonella enterica VII 504  
    Q66PQ8\_SALEE 1,40:g,z51:--] AA  
                                          [align](#)

Score = 72.7 bits (164), Expect = 7e-13  
Identities = 24/26 (92%), Positives = 24/26 (92%)

Query: 1 DGNGKVSTTINGEKVTLTVADIATGA 26  
          DGNG VSTTINGEKVTLTVADI TGA  
Sbjct: 291 DGNGTVSTTINGEKVTLTVADITTGA 316

tr Q53996 Phase 1 flagellin [fliC] [Salmonella enterica] 504 AA  
    Q53996\_9ENTR  
                                          [align](#)

Score = 72.7 bits (164), Expect = 7e-13  
Identities = 24/26 (92%), Positives = 24/26 (92%)

Query: 1 DGNGKVSTTINGEKVTLTVADIATGA 26  
          DGNG VSTTINGEKVTLTVADI TGA  
Sbjct: 291 DGNGTVSTTINGEKVTLTVADITTGA 316

sp Q06970 Flagellin (Phase-1-C flagellin) [fliC] [Salmonella derby] 504 AA  
    FLIC\_SALDE  
                                          [align](#)

Score = 71.5 bits (161), Expect = 2e-12  
Identities = 24/26 (92%), Positives = 24/26 (92%)

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NCBI BLAST program reference [PMID:9254694]:

Altschul S.F., Madden T.L., Schäffer A.A., Zhang J., Zhang Z., Miller W., Lipman D.J. Gapped BLAST and PSI-BLAST: a new generation of protein database search programs. Nucleic Acids Res. 25:3389-3402(1997).

Query: 11 AA

Date run: 2005-07-06 12:00:41 UTC+0100 on sib-gml.unil.ch

Program: NCBI BLASTP 1.5.4-Paracel [2003-06-05]

Database: EXPASY/UniProtKB

2,035,690 sequences; 659,769,346 total letters

UniProt Knowledgebase Release 5.4 consists of:

UniProtKB/Swiss-Prot Release 47.4 of 05-Jul-2005: 186882 entries

UniProtKB/TrEMBL Release 30.4 of 05-Jul-2005: 1837312 entries

[Taxonomic view](#)

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#### List of potentially matching sequences

Send selected sequences to

☐ Include query sequence

Db	AC	Description	Score	E-value
<input type="checkbox"/>	sp <a href="#">Q06983</a>	FLIC_SALSE Flagellin (Phase-1-C flagellin) [fliC] [Sal...	36	0.071
<input type="checkbox"/>	sp <a href="#">Q06982</a>	FLIC_SALRO Flagellin (Phase-1-C flagellin) [fliC] [Sal...	36	0.071
<input type="checkbox"/>	sp <a href="#">Q06974</a>	FLIC_SALON Flagellin (Phase-1-C flagellin) [fliC] [Sal...	36	0.071
<input type="checkbox"/>	sp <a href="#">O52959</a>	FLIC_SALNA Phase-1 flagellin [fliC] [Salmonella naestved]	36	0.071
<input type="checkbox"/>	sp <a href="#">Q06973</a>	FLIC_SALMO Flagellin (Phase-1-C flagellin) [fliC] [Sal...	36	0.071
<input type="checkbox"/>	sp <a href="#">Q06981</a>	FLIC_SALMC Flagellin (Phase-1-D flagellin) [fliC] [Sal...	36	0.071
<input type="checkbox"/>	sp <a href="#">Q06972</a>	FLIC_SALEN Flagellin (Phase-1-C flagellin) [fliC] [Sal...	36	0.071
<input type="checkbox"/>	sp <a href="#">Q06971</a>	FLIC_SALDU Flagellin (Phase-1-C flagellin) [fliC] [Sal...	36	0.071
<input type="checkbox"/>	sp <a href="#">Q06970</a>	FLIC_SALDE Flagellin (Phase-1-C flagellin) [fliC] [Sal...	36	0.071

<input type="checkbox"/>	sp	<a href="#">Q06969</a>	FLIC_SALBU	Flagellin (Phase-1-C	flagellin)	[fliC]	[Sal...	<a href="#">36</a>	0.071
<input type="checkbox"/>	sp	<a href="#">Q06968</a>	FLIC_SALBE	Flagellin (Phase-1-I	flagellin)	[fliC]	[Sal...	<a href="#">36</a>	0.071
<input type="checkbox"/>	tr	<a href="#">Q79DB7</a>	_SALET	Phase 1	flagellin	[fliC]	[Salmonella enterica su...	<a href="#">36</a>	0.071
<input type="checkbox"/>	tr	<a href="#">Q54515</a>	_SALET	Phase 1	flagellin	[fliC]	[Salmonella enterica su...	<a href="#">36</a>	0.071
<input type="checkbox"/>	tr	<a href="#">Q53995</a>	_9ENTR	Phase 1	flagellin	[fliC]	[Salmonella enterica]	<a href="#">36</a>	0.071
<input type="checkbox"/>	tr	<a href="#">Q53993</a>	_9ENTR	Phase 1	flagellin	[fliC]	[Salmonella enterica]	<a href="#">36</a>	0.071
<input type="checkbox"/>	tr	<a href="#">Q53992</a>	_9ENTR	Phase 1	flagellin	[fliC]	[Salmonella enterica]	<a href="#">36</a>	0.071
<input type="checkbox"/>	tr	<a href="#">Q53991</a>	_9ENTR	Phase 1	flagellin	[fliC]	[Salmonella enterica]	<a href="#">36</a>	0.071
<input type="checkbox"/>	tr	<a href="#">Q53WZ9</a>	_SALEN	Phase 1	flagellin	[fliC]	[Salmonella enteritidis]	<a href="#">36</a>	0.071
<input type="checkbox"/>	tr	<a href="#">Q6V2X1</a>	_9ENTR	Phase 1	flagellin	[fliC]	[Salmonella enterica]	<a href="#">36</a>	0.071
<input type="checkbox"/>	tr	<a href="#">Q6V2W5</a>	_9ENTR	Phase 1	flagellin	[fliC]	[Salmonella enterica]	<a href="#">36</a>	0.071
<input type="checkbox"/>	tr	<a href="#">Q6V2V9</a>	_9ENTR	Phase 1	flagellin	[fliC]	[Salmonella enterica]	<a href="#">36</a>	0.071
<input type="checkbox"/>	tr	<a href="#">Q6V2V3</a>	_9ENTR	Phase 1	flagellin	[fliC]	[Salmonella enterica]	<a href="#">36</a>	0.071
<input type="checkbox"/>	tr	<a href="#">Q66PR8</a>	_SALDE	Phase 1	flagellin	[fliC]	[Salmonella derby]	<a href="#">36</a>	0.071
<input type="checkbox"/>	tr	<a href="#">Q66PR7</a>	_SALMO	Phase 1	flagellin	[fliC]	[Salmonella montevideo]	<a href="#">36</a>	0.071
<input type="checkbox"/>	tr	<a href="#">Q66PR4</a>	_SALRO	Phase 1	flagellin	[fliC]	[Salmonella rostock]	<a href="#">36</a>	0.071
<input type="checkbox"/>	tr	<a href="#">Q66PR3</a>	_SALDU	Phase 1	flagellin	[fliC]	[Salmonella dublin]	<a href="#">36</a>	0.071
<input type="checkbox"/>	tr	<a href="#">Q66PR2</a>	_SALMC	Phase 1	flagellin	[fliC]	[Salmonella moscow]	<a href="#">36</a>	0.071
<input type="checkbox"/>	tr	<a href="#">Q66PR0</a>	_SALBU	Phase 1	flagellin	[fliC]	[Salmonella budapest]	<a href="#">36</a>	0.071
<input type="checkbox"/>	tr	<a href="#">Q9R406</a>	_SALPU	Phase 1	flagellin C (Fragment)	[fliC]	[Salmonell...	<a href="#">36</a>	0.071
<input type="checkbox"/>	tr	<a href="#">Q9R405</a>	_SALGL	Phase 1	flagellin C (Fragment)	[fliC]	[Salmonell...	<a href="#">36</a>	0.071
<input type="checkbox"/>	tr	<a href="#">Q9R2V0</a>	_SALPU	Phase 1	flagellin C (Fragment)	[fliC]	[Salmonell...	<a href="#">36</a>	0.071
<input type="checkbox"/>	tr	<a href="#">Q6V2X0</a>	_9ENTR	Phase 1	flagellin	[fliC]	[Salmonella enterica]	<a href="#">36</a>	0.071
<input type="checkbox"/>	tr	<a href="#">Q6V2W8</a>	_9ENTR	Phase 1	flagellin	[fliC]	[Salmonella enterica]	<a href="#">36</a>	0.071
<input type="checkbox"/>	tr	<a href="#">Q6V2W1</a>	_9ENTR	Phase 1	flagellin	[fliC]	[Salmonella enterica]	<a href="#">36</a>	0.071
<input type="checkbox"/>	tr	<a href="#">Q6V2V7</a>	_9ENTR	Phase 1	flagellin	[fliC]	[Salmonella enterica]	<a href="#">36</a>	0.071
<input type="checkbox"/>	tr	<a href="#">Q6V2V5</a>	_9ENTR	Phase 1	flagellin	[fliC]	[Salmonella enterica]	<a href="#">36</a>	0.071
<input type="checkbox"/>	tr	<a href="#">Q6V2V2</a>	_9ENTR	Phase 1	flagellin	[fliC]	[Salmonella enterica]	<a href="#">36</a>	0.071
<input type="checkbox"/>	tr	<a href="#">Q6V2V1</a>	_9ENTR	Phase 1	flagellin	[fliC]	[Salmonella enterica]	<a href="#">36</a>	0.071
<input type="checkbox"/>	tr	<a href="#">Q6V2V0</a>	_9ENTR	Phase 1	flagellin	[fliC]	[Salmonella enterica]	<a href="#">36</a>	0.071
<input type="checkbox"/>	tr	<a href="#">Q6V2U9</a>	_9ENTR	Phase 1	flagellin	[fliC]	[Salmonella enterica]	<a href="#">36</a>	0.071
<input type="checkbox"/>	tr	<a href="#">Q6V2U7</a>	_9ENTR	Phase 1	flagellin	[fliC]	[Salmonella enterica]	<a href="#">36</a>	0.071
<input type="checkbox"/>	tr	<a href="#">Q6V2U6</a>	_9ENTR	Phase 1	flagellin	[fliC]	[Salmonella enterica]	<a href="#">36</a>	0.071
<input type="checkbox"/>	tr	<a href="#">Q6V2U4</a>	_9ENTR	Phase 1	flagellin	[fliC]	[Salmonella enterica]	<a href="#">36</a>	0.071
<input type="checkbox"/>	tr	<a href="#">Q6V2U3</a>	_9ENTR	Phase 1	flagellin	[fliC]	[Salmonella enterica]	<a href="#">36</a>	0.071
<input type="checkbox"/>	tr	<a href="#">Q6V2U1</a>	_9ENTR	Phase 1	flagellin	[fliC]	[Salmonella enterica]	<a href="#">36</a>	0.071
<input type="checkbox"/>	tr	<a href="#">Q6V2T7</a>	_9ENTR	Phase 1	flagellin	[fliC]	[Salmonella enterica]	<a href="#">36</a>	0.071
<input type="checkbox"/>	tr	<a href="#">Q6V2H1</a>	_9ENTR	Phase 1	flagellin	[fliC]	[Salmonella enterica]	<a href="#">36</a>	0.071
<input type="checkbox"/>	tr	<a href="#">Q6V2G9</a>	_9ENTR	Phase 1	flagellin	[fliC]	[Salmonella enterica]	<a href="#">36</a>	0.071
<input type="checkbox"/>	tr	<a href="#">Q6V2G8</a>	_9ENTR	Phase 1	flagellin	[fliC]	[Salmonella enterica]	<a href="#">36</a>	0.071
<input type="checkbox"/>	tr	<a href="#">Q6V2G7</a>	_9ENTR	Phase 1	flagellin	[fliC]	[Salmonella enterica]	<a href="#">36</a>	0.071
<input type="checkbox"/>	tr	<a href="#">Q6LDG7</a>	_SALGL	Phase-1	flagellin	[fliC1]	[Salmonella gallinarum]	<a href="#">36</a>	0.071
<input type="checkbox"/>	tr	<a href="#">Q6LDG6</a>	_SALET	Phase-1	flagellin	[fliC1]	[Salmonella enterica s...	<a href="#">36</a>	0.071
<input type="checkbox"/>	tr	<a href="#">Q6LD27</a>	_SALET	Phase-1	flagellin (Fragment)	[fliC]	[Salmonella ...]	<a href="#">36</a>	0.071
<input type="checkbox"/>	tr	<a href="#">Q6LD24</a>	_SALET	Phase 1	flagellin	[fliC]	[Salmonella enterica su...	<a href="#">36</a>	0.071

<input type="checkbox"/>	tr	<a href="#">Q66PS0</a>	_SALET	Phase 1	flagellin	[fliC]	[Salmonella enterica su...	<a href="#">36</a>	0.071
<input type="checkbox"/>	tr	<a href="#">Q66PR9</a>	_9ENTR	Phase 1	flagellin	[fliC]	[Salmonella enterica su...	<a href="#">36</a>	0.071
<input type="checkbox"/>	tr	<a href="#">Q66PR6</a>	_SALET	Phase 1	flagellin	[fliC]	[Salmonella enterica su...	<a href="#">36</a>	0.071
<input type="checkbox"/>	tr	<a href="#">Q66PR5</a>	_SALNA	Phase 1	flagellin	[fliC]	[Salmonella naestved]	<a href="#">36</a>	0.071
<input type="checkbox"/>	tr	<a href="#">Q66PR1</a>	_SALSE	Phase 1	flagellin	[fliC]	[Salmonella senftenberg]	<a href="#">36</a>	0.071
<input type="checkbox"/>	tr	<a href="#">Q66PQ9</a>	_9ENTR	Phase 1	flagellin	[fliC]	[Salmonella enterica su...	<a href="#">36</a>	0.071
<input type="checkbox"/>	tr	<a href="#">Q66PQ8</a>	_SALEE	Phase 1	flagellin	[fliC]	[Salmonella enterica VI...	<a href="#">36</a>	0.071
<input type="checkbox"/>	tr	<a href="#">Q66PN4</a>	_SALET	Phase 1	flagellin	[fliC]	[Salmonella enterica su...	<a href="#">36</a>	0.071
<input type="checkbox"/>	tr	<a href="#">Q66PN3</a>	_SALET	Phase 1	flagellin	[fliC]	[Salmonella enterica su...	<a href="#">36</a>	0.071
<input type="checkbox"/>	tr	<a href="#">Q57381</a>	_SALEN	Phase-1	flagellin	[fliC1]	[Salmonella enteritidis]	<a href="#">36</a>	0.071
<input type="checkbox"/>	tr	<a href="#">Q54864</a>	_SALPU	Phase-1	flagellin	[fliC]	[Salmonella pullorum]	<a href="#">36</a>	0.071
<input type="checkbox"/>	tr	<a href="#">Q54863</a>	_SALPU	Phase-1	flagellin	[fliC]	[Salmonella pullorum]	<a href="#">36</a>	0.071
<input type="checkbox"/>	tr	<a href="#">Q54415</a>	_SALET	Phase-1	flagellin	(Fragment)	[fliC] [Salmonella ...	<a href="#">36</a>	0.071
<input type="checkbox"/>	tr	<a href="#">Q54329</a>	_SALET	Phase-1	flagellin	(Fragment)	[fliC] [Salmonella ...	<a href="#">36</a>	0.071
<input type="checkbox"/>	tr	<a href="#">Q54210</a>	_SALGL	Phase-1	flagellin	[fliC1]	[Salmonella gallinarum]	<a href="#">36</a>	0.071
<input type="checkbox"/>	tr	<a href="#">Q53998</a>	_SALEN	Phase-1	flagellin	(Fragment)	[fliC] [Salmonella ...	<a href="#">36</a>	0.071
<input type="checkbox"/>	tr	<a href="#">Q53996</a>	_9ENTR	Phase 1	flagellin	[fliC]	[Salmonella enterica]	<a href="#">36</a>	0.071
<input type="checkbox"/>	tr	<a href="#">Q53994</a>	_9ENTR	Phase 1	flagellin	[fliC]	[Salmonella enterica]	<a href="#">36</a>	0.071
<input type="checkbox"/>	tr	<a href="#">Q53990</a>	_9ENTR	Phase 1	flagellin	[fliC]	[Salmonella enterica]	<a href="#">36</a>	0.071
<input type="checkbox"/>	tr	<a href="#">Q53989</a>	_SALET	Phase-1	flagellin	(Fragment)	[fliC] [Salmonella ...	<a href="#">36</a>	0.071
<input type="checkbox"/>	tr	<a href="#">Q53970</a>	_SALDU	Phase-1	flagellin	[fliC1]	[Salmonella dublin]	<a href="#">36</a>	0.071
<input type="checkbox"/>	tr	<a href="#">Q53967</a>	_SALET	Phase-1	flagellin	(Fragment)	[fliC] [Salmonella ...	<a href="#">36</a>	0.071
<input type="checkbox"/>	tr	<a href="#">Q53822</a>	_SALET	Phase-1	flagellin	(Fragment)	[fliC] [Salmonella ...	<a href="#">36</a>	0.071
<input type="checkbox"/>	tr	<a href="#">Q53821</a>	_SALET	Phase-1	flagellin	(Fragment)	[fliC] [Salmonella ...	<a href="#">36</a>	0.071
<input type="checkbox"/>	tr	<a href="#">Q53583</a>	_SALET	Phase-1	flagellin	(Fragment)	[fliC] [Salmonella ...	<a href="#">36</a>	0.071
<input type="checkbox"/>	tr	<a href="#">Q54489</a>	_SALET	Phase 1	flagellin	[fliC]	[Salmonella enterica su...	<a href="#">32</a>	1.8
<input type="checkbox"/>	tr	<a href="#">Q6V2U0</a>	_9ENTR	Phase 1	flagellin	[fliC]	[Salmonella enterica]	<a href="#">32</a>	1.8
<input type="checkbox"/>	tr	<a href="#">Q54414</a>	_SALET	Phase-1	flagellin	(Fragment)	[fliC] [Salmonella ...	<a href="#">32</a>	1.8

## Graphical overview of the alignments

[Click here](#)to resubmit your query after masking regions matching [PROSITE](#) profiles or [Pfam](#) HMMs([Help](#)) (use [ScanProsite](#) for more details about PROSITE matches)

Profile hits

Pfam hits

Submission	Matches on query sequence	Mat
1	1	1
FLIC_SALSE		
FLIC_SALRO		
FLIC_SALON		
FLIC_SALNA		
FLIC_SALMO		
FLIC_SALMC		
FLIC_SALEN		
FLIC_SALOU		
FLIC_SALDE		
FLIC_SALBU		
FLIC_SALBE		
Q79DB7		
Q54515		
Q53995		
Q53993		
Q53992		
Q53991		
Q53M29		
Q6V2X1		
Q6V2M5		
Q6V2V9		
Q6V2V3		
Q66PR8		
Q66PR7		
Q66PR4		
Q66PR3		
Q66PR2		
Q66PR0		
Q9R406		
Q9R405		
Q9R2V0		
Q6V2X0		
Q6V2M8		
Q6V2M1		
Q6V2V7		
Q6V2V5		
Q6V2V2		
Q6V2V1		
Q6V2V0		
Q6V2U9		
Q6V2U7		
Q6V2U6		
Q6V2U4		
Q6V2U3		
Q6V2U1		
Q6V2T7		
Q6V2H1		
Q6V2G9		
Q6V2G8		
Q6V2G7		
Q6LDG7		
Q6LDG6		
Q6LD27		
Q6LD24		
Q66PS0		
Q66PR9		
Q66PR6		
Q66PR5		
Q66PR1		
Q66PQ9		
Q66PQ8		
Q66PN4		
Q66PN3		
Q57381		
Q54864		
Q54863		
Q54415		
Q54329		
Q54210		
Q53998		
Q53996		
Q53994		
Q53990		
Q53989		
Q53970		
Q53967		
Q53822		
Q53821		
Q53583		
Q54489		
Q6V2U0		
Q54414		
1	1	1

sp Q06983 Flagellin (Phase-1-C flagellin) [fliC] [Salmonella] 504  
FLIC\_SALSE senftenberg] AA  
align

Score = 36.3 bits (78), Expect = 0.071  
Identities = 11/11 (100%), Positives = 11/11 (100%)

Query: 1 STTINGEKVTL 11  
STTINGEKVTL  
Sbjct: 297 STTINGEKVTL 307

sp Q06982 Flagellin (Phase-1-C flagellin) [fliC] [Salmonella] 504  
FLIC\_SALRO rostock] AA  
align

Score = 36.3 bits (78), Expect = 0.071  
Identities = 11/11 (100%), Positives = 11/11 (100%)

Query: 1 STTINGEKVTL 11  
STTINGEKVTL  
Sbjct: 297 STTINGEKVTL 307

sp Q06974 Flagellin (Phase-1-C flagellin) [fliC] [Salmonella] 507  
FLIC\_SALON oranienberg] AA  
align

Score = 36.3 bits (78), Expect = 0.071  
Identities = 11/11 (100%), Positives = 11/11 (100%)

Query: 1 STTINGEKVTL 11  
STTINGEKVTL  
Sbjct: 300 STTINGEKVTL 310

sp O52959 Phase-1 flagellin [fliC] [Salmonella naestved] 504 AA  
FLIC\_SALNA  
align

Score = 36.3 bits (78), Expect = 0.071  
Identities = 11/11 (100%), Positives = 11/11 (100%)

Query: 1 STTINGEKVTL 11  
STTINGEKVTL  
Sbjct: 297 STTINGEKVTL 307

sp Q06973 Flagellin (Phase-1-C flagellin) [fliC] [Salmonella] 504  
FLIC\_SALMO montevideo] AA  
align

Score = 36.3 bits (78), Expect = 0.071  
Identities = 11/11 (100%), Positives = 11/11 (100%)

Query: 1 STTINGEKVTL 11  
STTINGEKVTL  
Sbjct: 297 STTINGEKVTL 307

sp Q06981 Flagellin (Phase-1-D flagellin) [fliC] [Salmonella moscow] 504 AA  
FLIC\_SALMC  
align

Score = 36.3 bits (78), Expect = 0.071  
Identities = 11/11 (100%), Positives = 11/11 (100%)

Query: 1 STTINGEKVTL 11  
STTINGEKVTL  
Sbjct: 297 STTINGEKVTL 307

sp Q06972 Flagellin (Phase-1-C flagellin) [fliC] [Salmonella] 504  
FLIC\_SALEN enteritidis] AA  
align

Score = 36.3 bits (78), Expect = 0.071  
Identities = 11/11 (100%), Positives = 11/11 (100%)

Query: 1 STTINGEKVTL 11  
STTINGEKVTL  
Sbjct: 297 STTINGEKVTL 307

sp Q06971 Flagellin (Phase-1-C flagellin) [fliC] [Salmonella dublin] 504 AA  
FLIC\_SALDU  
align

Score = 36.3 bits (78), Expect = 0.071  
Identities = 11/11 (100%), Positives = 11/11 (100%)

Query: 1 STTINGEKVTL 11  
STTINGEKVTL  
Sbjct: 297 STTINGEKVTL 307

sp Q06970 Flagellin (Phase-1-C flagellin) [fliC] [Salmonella derby] 504 AA  
FLIC\_SALDE  
align

Score = 36.3 bits (78), Expect = 0.071  
Identities = 11/11 (100%), Positives = 11/11 (100%)

Query: 1 STTINGEKVTL 11  
STTINGEKVTL  
Sbjct: 297 STTINGEKVTL 307

sp Q06969 Flagellin (Phase-1-C flagellin) [fliC] [Salmonella 504  
FLIC\_SALBU budapest] AA  
align

Score = 36.3 bits (78), Expect = 0.071  
Identities = 11/11 (100%), Positives = 11/11 (100%)

Query: 1 STTINGEKVTL 11  
STTINGEKVTL  
Sbjct: 297 STTINGEKVTL 307

sp Q06968 Flagellin (Phase-1-I flagellin) [fliC] [Salmonella berta] 507 AA  
FLIC\_SALBE  
align

Score = 36.3 bits (78), Expect = 0.071  
Identities = 11/11 (100%), Positives = 11/11 (100%)

Query: 1 STTINGEKVTL 11  
STTINGEKVTL  
Sbjct: 300 STTINGEKVTL 310

tr Q79DB7 Phase 1 flagellin [fliC] [Salmonella enterica subsp. 505  
Q79DB7\_SALET enterica  
serovar Othmarschen] AA  
align

Score = 36.3 bits (78), Expect = 0.071  
Identities = 11/11 (100%), Positives = 11/11 (100%)

Query: 1 STTINGEKVTL 11  
STTINGEKVTL  
Sbjct: 298 STTINGEKVTL 308

tr Q54515 Phase 1 flagellin [fliC] [Salmonella enterica subsp. 508  
Q54515\_SALET enterica  
serovar Pensacola] AA  
align

Score = 36.3 bits (78), Expect = 0.071  
Identities = 11/11 (100%), Positives = 11/11 (100%)

Query: 1 STTINGEKVTL 11  
STTINGEKVTL  
Sbjct: 301 STTINGEKVTL 311

tr Q53995 Phase 1 flagellin [fliC] [Salmonella enterica] 508 AA  
Q53995\_9ENTR  
[align](#)

Score = 36.3 bits (78), Expect = 0.071  
Identities = 11/11 (100%), Positives = 11/11 (100%)

Query: 1 STTINGEKVTL 11  
STTINGEKVTL  
Sbjct: 301 STTINGEKVTL 311

tr Q53993 Phase 1 flagellin [fliC] [Salmonella enterica] 508 AA  
Q53993\_9ENTR  
[align](#)

Score = 36.3 bits (78), Expect = 0.071  
Identities = 11/11 (100%), Positives = 11/11 (100%)

Query: 1 STTINGEKVTL 11  
STTINGEKVTL  
Sbjct: 301 STTINGEKVTL 311

tr Q53992 Phase 1 flagellin [fliC] [Salmonella enterica] 505 AA  
Q53992\_9ENTR  
[align](#)

Score = 36.3 bits (78), Expect = 0.071  
Identities = 11/11 (100%), Positives = 11/11 (100%)

Query: 1 STTINGEKVTL 11  
STTINGEKVTL  
Sbjct: 298 STTINGEKVTL 308

tr Q53991 Phase 1 flagellin [fliC] [Salmonella enterica] 504 AA  
Q53991\_9ENTR  
[align](#)

Score = 36.3 bits (78), Expect = 0.071  
Identities = 11/11 (100%), Positives = 11/11 (100%)

Query: 1 STTINGEKVTL 11  
STTINGEKVTL  
Sbjct: 297 STTINGEKVTL 307

tr Q53WZ9 Phase 1 flagellin [fliC] [Salmonella enteritidis] 505 AA  
Q53WZ9\_SALEN

align

Score = 36.3 bits (78), Expect = 0.071  
Identities = 11/11 (100%), Positives = 11/11 (100%)

Query: 1 STTINGEKVTL 11  
STTINGEKVTL  
Sbjct: 298 STTINGEKVTL 308

tr Q6V2X1 Phase 1 flagellin [fliC] [Salmonella enterica] 505 AA  
Q6V2X1\_9ENTR

align

Score = 36.3 bits (78), Expect = 0.071  
Identities = 11/11 (100%), Positives = 11/11 (100%)

Query: 1 STTINGEKVTL 11  
STTINGEKVTL  
Sbjct: 298 STTINGEKVTL 308

tr Q6V2W5 Phase 1 flagellin [fliC] [Salmonella enterica] 505 AA  
Q6V2W5\_9ENTR

align

Score = 36.3 bits (78), Expect = 0.071  
Identities = 11/11 (100%), Positives = 11/11 (100%)

Query: 1 STTINGEKVTL 11  
STTINGEKVTL  
Sbjct: 298 STTINGEKVTL 308

tr Q6V2V9 Phase 1 flagellin [fliC] [Salmonella enterica] 505 AA  
Q6V2V9\_9ENTR /

align

Score = 36.3 bits (78), Expect = 0.071  
Identities = 11/11 (100%), Positives = 11/11 (100%)

Query: 1 STTINGEKVTL 11  
STTINGEKVTL  
Sbjct: 298 STTINGEKVTL 308

tr Q6V2V3 Phase 1 flagellin [fliC] [Salmonella enterica] 505 AA  
Q6V2V3\_9ENTR  
align

Score = 36.3 bits (78), Expect = 0.071  
Identities = 11/11 (100%), Positives = 11/11 (100%)

Query: 1 STTINGEKVTL 11  
STTINGEKVTL  
Sbjct: 298 STTINGEKVTL 308

tr Q66PR8 Phase 1 flagellin [fliC] [Salmonella derby] 505 AA  
Q66PR8\_SALDE  
align

Score = 36.3 bits (78), Expect = 0.071  
Identities = 11/11 (100%), Positives = 11/11 (100%)

Query: 1 STTINGEKVTL 11  
STTINGEKVTL  
Sbjct: 298 STTINGEKVTL 308

tr Q66PR7 Phase 1 flagellin [fliC] [Salmonella montevideo] 505 AA  
Q66PR7\_SALMO  
align

Score = 36.3 bits (78), Expect = 0.071  
Identities = 11/11 (100%), Positives = 11/11 (100%)

Query: 1 STTINGEKVTL 11  
STTINGEKVTL  
Sbjct: 298 STTINGEKVTL 308

tr Q66PR4 Phase 1 flagellin [fliC] [Salmonella rostock] 505 AA  
Q66PR4\_SALRO  
align

Score = 36.3 bits (78), Expect = 0.071  
Identities = 11/11 (100%), Positives = 11/11 (100%)

Query: 1 STTINGEKVTL 11  
STTINGEKVTL  
Sbjct: 298 STTINGEKVTL 308

tr Q66PR3 Phase 1 flagellin [fliC] [Salmonella dublin] 505 AA  
Q66PR3\_SALDU  
align

Score = 36.3 bits (78), Expect = 0.071  
Identities = 11/11 (100%), Positives = 11/11 (100%)

Query: 1 STTINGEKVTL 11  
STTINGEKVTL  
Sbjct: 298 STTINGEKVTL 308

tr Q66PR2 Phase 1 flagellin [fliC] [Salmonella moscow] 505 AA  
Q66PR2\_SALMC  
align

Score = 36.3 bits (78), Expect = 0.071  
Identities = 11/11 (100%), Positives = 11/11 (100%)

Query: 1 STTINGEKVTL 11  
STTINGEKVTL  
Sbjct: 298 STTINGEKVTL 308

tr Q66PR0 Phase 1 flagellin [fliC] [Salmonella budapest] 505 AA  
Q66PR0\_SALBU  
align

Score = 36.3 bits (78), Expect = 0.071  
Identities = 11/11 (100%), Positives = 11/11 (100%)

Query: 1 STTINGEKVTL 11  
STTINGEKVTL  
Sbjct: 298 STTINGEKVTL 308

tr Q9R406 Phase 1 flagellin C (Fragment) [fliC] [Salmonella 45 AA  
Q9R406\_SALPU pullorum]  
align

Score = 36.3 bits (78), Expect = 0.071  
Identities = 11/11 (100%), Positives = 11/11 (100%)

Query: 1 STTINGEKVTL 11  
STTINGEKVTL  
Sbjct: 3 STTINGEKVTL 13

tr Q9R405 Phase 1 flagellin C (Fragment) [fliC] [Salmonella 45 AA  
Q9R405\_SALGL gallinarum]  
align

Score = 36.3 bits (78), Expect = 0.071  
Identities = 11/11 (100%), Positives = 11/11 (100%)

Query: 1 STTINGEKVTL 11  
STTINGEKVTL  
Sbjct: 3 STTINGEKVTL 13

tr Q9R2V0 Phase 1 flagellin C (Fragment) [fliC] [Salmonella] 52 AA  
Q9R2V0\_SALPU pullorum  
align

Score = 36.3 bits (78), Expect = 0.071  
Identities = 11/11 (100%), Positives = 11/11 (100%)

Query: 1 STTINGEKVTL 11  
STTINGEKVTL  
Sbjct: 3 STTINGEKVTL 13

tr Q6V2X0 Phase 1 flagellin [fliC] [Salmonella enterica] 505 AA  
Q6V2X0\_9ENTR  
align

Score = 36.3 bits (78), Expect = 0.071  
Identities = 11/11 (100%), Positives = 11/11 (100%)

Query: 1 STTINGEKVTL 11  
STTINGEKVTL  
Sbjct: 298 STTINGEKVTL 308

tr Q6V2W8 Phase 1 flagellin [fliC] [Salmonella enterica] 505 AA  
Q6V2W8\_9ENTR  
align

Score = 36.3 bits (78), Expect = 0.071  
Identities = 11/11 (100%), Positives = 11/11 (100%)

Query: 1 STTINGEKVTL 11  
STTINGEKVTL  
Sbjct: 298 STTINGEKVTL 308

tr Q6V2W1 Phase 1 flagellin [fliC] [Salmonella enterica] 505 AA  
Q6V2W1\_9ENTR  
align

Score = 36.3 bits (78), Expect = 0.071  
Identities = 11/11 (100%), Positives = 11/11 (100%)

Query: 1 STTINGEKVTL 11  
STTINGEKVTL  
Sbjct: 298 STTINGEKVTL 308

tr Q6V2V7 Phase 1 flagellin [fliC] [Salmonella enterica] 504 AA  
Q6V2V7\_9ENTR

align

Score = 36.3 bits (78), Expect = 0.071  
Identities = 11/11 (100%), Positives = 11/11 (100%)

Query: 1 STTINGEKVTL 11  
STTINGEKVTL  
Sbjct: 298 STTINGEKVTL 308

tr Q6V2V5 Phase 1 flagellin [fliC] [Salmonella enterica] 505 AA  
Q6V2V5\_9ENTR

align

Score = 36.3 bits (78), Expect = 0.071  
Identities = 11/11 (100%), Positives = 11/11 (100%)

Query: 1 STTINGEKVTL 11  
STTINGEKVTL  
Sbjct: 298 STTINGEKVTL 308

tr Q6V2V2 Phase 1 flagellin [fliC] [Salmonella enterica] 505 AA  
Q6V2V2\_9ENTR

align

Score = 36.3 bits (78), Expect = 0.071  
Identities = 11/11 (100%), Positives = 11/11 (100%)

Query: 1 STTINGEKVTL 11  
STTINGEKVTL  
Sbjct: 298 STTINGEKVTL 308

tr Q6V2V1 Phase 1 flagellin [fliC] [Salmonella enterica] 505 AA  
Q6V2V1\_9ENTR

align

Score = 36.3 bits (78), Expect = 0.071  
Identities = 11/11 (100%), Positives = 11/11 (100%)

Query: 1 STTINGEKVTL 11  
STTINGEKVTL  
Sbjct: 298 STTINGEKVTL 308

tr Q6V2V0 Phase 1 flagellin [fliC] [Salmonella enterica] 505 AA  
Q6V2V0\_9ENTR  
align

Score = 36.3 bits (78), Expect = 0.071  
Identities = 11/11 (100%), Positives = 11/11 (100%)

Query: 1 STTINGEKVTL 11  
STTINGEKVTL  
Sbjct: 298 STTINGEKVTL 308

tr Q6V2U9 Phase 1 flagellin [fliC] [Salmonella enterica] 505 AA  
Q6V2U9\_9ENTR  
align

Score = 36.3 bits (78), Expect = 0.071  
Identities = 11/11 (100%), Positives = 11/11 (100%)

Query: 1 STTINGEKVTL 11  
STTINGEKVTL  
Sbjct: 298 STTINGEKVTL 308

tr Q6V2U7 Phase 1 flagellin [fliC] [Salmonella enterica] 505 AA  
Q6V2U7\_9ENTR  
align

Score = 36.3 bits (78), Expect = 0.071  
Identities = 11/11 (100%), Positives = 11/11 (100%)

Query: 1 STTINGEKVTL 11  
STTINGEKVTL  
Sbjct: 298 STTINGEKVTL 308

tr Q6V2U6 Phase 1 flagellin [fliC] [Salmonella enterica] 505 AA  
Q6V2U6\_9ENTR  
align

Score = 36.3 bits (78), Expect = 0.071  
Identities = 11/11 (100%), Positives = 11/11 (100%)

Query: 1 STTINGEKVTL 11  
STTINGEKVTL  
Sbjct: 298 STTINGEKVTL 308

tr Q6V2U4 Phase 1 flagellin [fliC] [Salmonella enterica] 508 AA  
Q6V2U4\_9ENTR  
align

Score = 36.3 bits (78), Expect = 0.071  
Identities = 11/11 (100%), Positives = 11/11 (100%)

Query: 1 STTINGEKVTL 11  
STTINGEKVTL  
Sbjct: 301 STTINGEKVTL 311

tr Q6V2U3 Phase 1 flagellin [fliC] [Salmonella enterica] 508 AA  
Q6V2U3\_9ENTR  
[align](#)

Score = 36.3 bits (78), Expect = 0.071  
Identities = 11/11 (100%), Positives = 11/11 (100%)

Query: 1 STTINGEKVTL 11  
STTINGEKVTL  
Sbjct: 301 STTINGEKVTL 311

tr Q6V2U1 Phase 1 flagellin [fliC] [Salmonella enterica] 508 AA  
Q6V2U1\_9ENTR  
[align](#)

Score = 36.3 bits (78), Expect = 0.071  
Identities = 11/11 (100%), Positives = 11/11 (100%)

Query: 1 STTINGEKVTL 11  
STTINGEKVTL  
Sbjct: 301 STTINGEKVTL 311

tr Q6V2T7 Phase 1 flagellin [fliC] [Salmonella enterica] 504 AA  
Q6V2T7\_9ENTR  
[align](#)

Score = 36.3 bits (78), Expect = 0.071  
Identities = 11/11 (100%), Positives = 11/11 (100%)

Query: 1 STTINGEKVTL 11  
STTINGEKVTL  
Sbjct: 298 STTINGEKVTL 308

tr Q6V2H1 Phase 1 flagellin [fliC] [Salmonella enterica] 508 AA  
Q6V2H1\_9ENTR  
[align](#)

Score = 36.3 bits (78), Expect = 0.071  
Identities = 11/11 (100%), Positives = 11/11 (100%)

Query: 1 STTINGEKVTL 11  
STTINGEKVTL  
Sbjct: 301 STTINGEKVTL 311

tr Q6V2G9 Phase 1 flagellin [fliC] [Salmonella enterica] 505 AA  
Q6V2G9\_9ENTR  
[align](#)

Score = 36.3 bits (78), Expect = 0.071  
Identities = 11/11 (100%), Positives = 11/11 (100%)

Query: 1 STTINGEKVTL 11  
STTINGEKVTL  
Sbjct: 298 STTINGEKVTL 308

tr Q6V2G8 Phase 1 flagellin [fliC] [Salmonella enterica] 504 AA  
Q6V2G8\_9ENTR  
[align](#)

Score = 36.3 bits (78), Expect = 0.071  
Identities = 11/11 (100%), Positives = 11/11 (100%)

Query: 1 STTINGEKVTL 11  
STTINGEKVTL  
Sbjct: 298 STTINGEKVTL 308

tr Q6V2G7 Phase 1 flagellin [fliC] [Salmonella enterica] 504 AA  
Q6V2G7\_9ENTR  
[align](#)

Score = 36.3 bits (78), Expect = 0.071  
Identities = 11/11 (100%), Positives = 11/11 (100%)

Query: 1 STTINGEKVTL 11  
STTINGEKVTL  
Sbjct: 298 STTINGEKVTL 308

tr Q6LDG7 Phase-1 flagellin [fliC1] [Salmonella gallinarum] 505 AA  
Q6LDG7\_SALGL  
[align](#)

Score = 36.3 bits (78), Expect = 0.071  
Identities = 11/11 (100%), Positives = 11/11 (100%)

Query: 1 STTINGEKVTL 11  
STTINGEKVTL  
Sbjct: 298 STTINGEKVTL 308

tr Q6LDG6 Phase-1 flagellin [fliC1] [Salmonella enterica subsp. 505  
Q6LDG6\_SALET enterica AA  
serovar Gallinarum/pullorum] align

Score = 36.3 bits (78), Expect = 0.071  
Identities = 11/11 (100%), Positives = 11/11 (100%)

Query: 1 STTINGEKVTL 11  
STTINGEKVTL  
Sbjct: 298 STTINGEKVTL 308

tr Q6LD27 Phase-1 flagellin (Fragment) [fliC] [Salmonella enterica 504  
Q6LD27\_SALET subsp. AA  
enterica serovar Simsbury] align

Score = 36.3 bits (78), Expect = 0.071  
Identities = 11/11 (100%), Positives = 11/11 (100%)

Query: 1 STTINGEKVTL 11  
STTINGEKVTL  
Sbjct: 297 STTINGEKVTL 307

tr Q6LD24 Phase 1 flagellin [fliC] [Salmonella enterica subsp. 508  
Q6LD24\_SALET enterica AA  
serovar Banana] align

Score = 36.3 bits (78), Expect = 0.071  
Identities = 11/11 (100%), Positives = 11/11 (100%)

Query: 1 STTINGEKVTL 11  
STTINGEKVTL  
Sbjct: 301 STTINGEKVTL 311

tr Q66PS0 Phase 1 flagellin [fliC] [Salmonella enterica subsp. 505  
Q66PS0\_SALET enterica AA  
serovar Agona] align

Score = 36.3 bits (78), Expect = 0.071  
Identities = 11/11 (100%), Positives = 11/11 (100%)

Query: 1 STTINGEKVTL 11  
STTINGEKVTL  
Sbjct: 298 STTINGEKVTL 308

tr Q66PR9 Phase 1 flagellin [fliC] [Salmonella enterica subsp. 505  
Q66PR9\_9ENTR salamae AA  
serovar 42:f,g,t:--] align

Score = 36.3 bits (78), Expect = 0.071  
Identities = 11/11 (100%), Positives = 11/11 (100%)

Query: 1 STTINGEKVTL 11  
STTINGEKVTL  
Sbjct: 298 STTINGEKVTL 308

tr Q66PR6 Phase 1 flagellin [fliC] [Salmonella enterica subsp. 505  
Q66PR6\_SALET enterica AA  
serovar Enteritidis] align

Score = 36.3 bits (78), Expect = 0.071  
Identities = 11/11 (100%), Positives = 11/11 (100%)

Query: 1 STTINGEKVTL 11  
STTINGEKVTL  
Sbjct: 298 STTINGEKVTL 308

tr Q66PR5 Phase 1 flagellin [fliC] [Salmonella naestved] 505 AA  
Q66PR5\_SALNA align

Score = 36.3 bits (78), Expect = 0.071  
Identities = 11/11 (100%), Positives = 11/11 (100%)

Query: 1 STTINGEKVTL 11  
STTINGEKVTL  
Sbjct: 298 STTINGEKVTL 308

tr Q66PR1 Phase 1 flagellin [fliC] [Salmonella senftenberg] 505 AA  
Q66PR1\_SALSE align

Score = 36.3 bits (78), Expect = 0.071  
Identities = 11/11 (100%), Positives = 11/11 (100%)

Query: 1 STTINGEKVTL 11  
STTINGEKVTL  
Sbjct: 298 STTINGEKVTL 308

tr Q66PQ9 Phase 1 flagellin [fliC] [Salmonella enterica subsp. 504  
Q66PQ9\_9ENTR houtenae AA  
serovar 45a,b:g,z51:-] align

Score = 36.3 bits (78), Expect = 0.071  
Identities = 11/11 (100%), Positives = 11/11 (100%)

Query: 1 STTINGEKVTL 11  
STTINGEKVTL  
Sbjct: 297 STTINGEKVTL 307

tr Q66PQ8 Phase 1 flagellin [fliC] [Salmonella enterica VII 504  
Q66PQ8\_SALEE 1,40:g,z51:--] AA  
[align](#)

Score = 36.3 bits (78), Expect = 0.071  
Identities = 11/11 (100%), Positives = 11/11 (100%)

Query: 1 STTINGEKVTL 11  
STTINGEKVTL  
Sbjct: 297 STTINGEKVTL 307

tr Q66PN4 Phase 1 flagellin [fliC] [Salmonella enterica subsp. 505  
Q66PN4\_SALET enterica AA  
serovar Emek] [align](#)

Score = 36.3 bits (78), Expect = 0.071  
Identities = 11/11 (100%), Positives = 11/11 (100%)

Query: 1 STTINGEKVTL 11  
STTINGEKVTL  
Sbjct: 298 STTINGEKVTL 308

tr Q66PN3 Phase 1 flagellin [fliC] [Salmonella enterica subsp. 505  
Q66PN3\_SALET enterica AA  
serovar Enteritidis] [align](#)

Score = 36.3 bits (78), Expect = 0.071  
Identities = 11/11 (100%), Positives = 11/11 (100%)

Query: 1 STTINGEKVTL 11  
STTINGEKVTL  
Sbjct: 298 STTINGEKVTL 308

tr Q57381 Phase-1 flagellin [fliC1] [Salmonella enteritidis] 505 AA  
Q57381\_SALEN [align](#)

Score = 36.3 bits (78), Expect = 0.071  
Identities = 11/11 (100%), Positives = 11/11 (100%)

Query: 1 STTINGEKVTL 11  
STTINGEKVTL  
Sbjct: 298 STTINGEKVTL 308

tr Q54864 Phase-1 flagellin [fliC] [Salmonella pullorum] 505 AA  
Q54864\_SALPU align

Score = 36.3 bits (78), Expect = 0.071  
Identities = 11/11 (100%), Positives = 11/11 (100%)

Query: 1 STTINGEKVTL 11  
STTINGEKVTL  
Sbjct: 298 STTINGEKVTL 308

tr Q54863 Phase-1 flagellin [fliC] [Salmonella pullorum] 505 AA  
Q54863\_SALPU align

Score = 36.3 bits (78), Expect = 0.071  
Identities = 11/11 (100%), Positives = 11/11 (100%)

Query: 1 STTINGEKVTL 11  
STTINGEKVTL  
Sbjct: 298 STTINGEKVTL 308

tr Q54415 Phase-1 flagellin (Fragment) [fliC] [Salmonella enterica] 507  
Q54415\_SALET subsp. AA  
enterica serovar Monschaui] align

Score = 36.3 bits (78), Expect = 0.071  
Identities = 11/11 (100%), Positives = 11/11 (100%)

Query: 1 STTINGEKVTL 11  
STTINGEKVTL  
Sbjct: 300 STTINGEKVTL 310

tr Q54329 Phase-1 flagellin (Fragment) [fliC] [Salmonella enterica] 504  
Q54329\_SALET subsp. AA  
enterica serovar Enteritidis var. jena] align

Score = 36.3 bits (78), Expect = 0.071  
Identities = 11/11 (100%), Positives = 11/11 (100%)

Query: 1 STTINGEKVTL 11  
STTINGEKVTL  
Sbjct: 297 STTINGEKVTL 307

tr Q54210 Phase-1 flagellin [fliC1] [Salmonella gallinarum] 494 AA  
Q54210\_SALGL

align

Score = 36.3 bits (78), Expect = 0.071  
Identities = 11/11 (100%), Positives = 11/11 (100%)

Query: 1 STTINGEKVTL 11  
STTINGEKVTL  
Sbjct: 298 STTINGEKVTL 308

tr Q53998 Phase-1 flagellin (Fragment) [fliC] [Salmonella 493  
Q53998\_SALEN enteritidis] AA

align

Score = 36.3 bits (78), Expect = 0.071  
Identities = 11/11 (100%), Positives = 11/11 (100%)

Query: 1 STTINGEKVTL 11  
STTINGEKVTL  
Sbjct: 286 STTINGEKVTL 296

tr Q53996 Phase 1 flagellin [fliC] [Salmonella enterica] 504 AA  
Q53996\_9ENTR

align

Score = 36.3 bits (78), Expect = 0.071  
Identities = 11/11 (100%), Positives = 11/11 (100%)

Query: 1 STTINGEKVTL 11  
STTINGEKVTL  
Sbjct: 297 STTINGEKVTL 307

tr Q53994 Phase 1 flagellin [fliC] [Salmonella enterica] 504 AA  
Q53994\_9ENTR

align

Score = 36.3 bits (78), Expect = 0.071  
Identities = 11/11 (100%), Positives = 11/11 (100%)

Query: 1 STTINGEKVTL 11  
STTINGEKVTL  
Sbjct: 298 STTINGEKVTL 308

tr Q53990 Phase 1 flagellin [fliC] [Salmonella enterica] 505 AA  
Q53990\_9ENTR  
align

Score = 36.3 bits (78), Expect = 0.071  
Identities = 11/11 (100%), Positives = 11/11 (100%)

Query: 1 STTINGEKVTL 11  
STTINGEKVTL  
Sbjct: 298 STTINGEKVTL 308

tr Q53989 Phase-1 flagellin (Fragment) [fliC] [Salmonella enterica] 504  
Q53989\_SALET subsp. AA  
enterica serovar Essen] align

Score = 36.3 bits (78), Expect = 0.071  
Identities = 11/11 (100%), Positives = 11/11 (100%)

Query: 1 STTINGEKVTL 11  
STTINGEKVTL  
Sbjct: 297 STTINGEKVTL 307

tr Q53970 Phase-1 flagellin [fliC1] [Salmonella dublin] 505 AA  
Q53970\_SALDU  
align

Score = 36.3 bits (78), Expect = 0.071  
Identities = 11/11 (100%), Positives = 11/11 (100%)

Query: 1 STTINGEKVTL 11  
STTINGEKVTL  
Sbjct: 298 STTINGEKVTL 308

tr Q53967 Phase-1 flagellin (Fragment) [fliC] [Salmonella enterica] 465  
Q53967\_SALET subsp. AA  
enterica serovar Enteritidis var. danysz] align

Score = 36.3 bits (78), Expect = 0.071  
Identities = 11/11 (100%), Positives = 11/11 (100%)

Query: 1 STTINGEKVTL 11  
STTINGEKVTL  
Sbjct: 297 STTINGEKVTL 307

tr Q53822 Phase-1 flagellin (Fragment) [fliC] [Salmonella enterica] 504  
Q53822\_SALET subsp. AA  
enterica serovar Enteritidis var. chaco] align

Score = 36.3 bits (78), Expect = 0.071  
Identities = 11/11 (100%), Positives = 11/11 (100%)

Query: 1 STTINGEKVTL 11  
STTINGEKVTL  
Sbjct: 297 STTINGEKVTL 307

tr Q53821 Phase-1 flagellin (Fragment) [fliC] [Salmonella enterica 507  
Q53821\_SALET subsp. AA  
enterica serovar California] align

Score = 36.3 bits (78), Expect = 0.071  
Identities = 11/11 (100%), Positives = 11/11 (100%)

Query: 1 STTINGEKVTL 11  
STTINGEKVTL  
Sbjct: 300 STTINGEKVTL 310

tr Q53583 Phase-1 flagellin (Fragment) [fliC] [Salmonella enterica 504  
Q53583\_SALET subsp. AA  
enterica serovar Adelaide] align

Score = 36.3 bits (78), Expect = 0.071  
Identities = 11/11 (100%), Positives = 11/11 (100%)

Query: 1 STTINGEKVTL 11  
STTINGEKVTL  
Sbjct: 297 STTINGEKVTL 307

tr Q54489 Phase 1 flagellin [fliC] [Salmonella enterica subsp. 504  
Q54489\_SALET enterica AA  
serovar Newmexico] align

Score = 31.6 bits (67), Expect = 1.8  
Identities = 10/11 (90%), Positives = 10/11 (90%)

Query: 1 STTINGEKVTL 11  
ST INGEKVTL  
Sbjct: 297 STMINGEKVTL 307

tr Q6V2U0 Phase 1 flagellin [fliC] [Salmonella enterica] 504 AA  
Q6V2U0\_9ENTR  
align

Score = 31.6 bits (67), Expect = 1.8  
Identities = 10/11 (90%), Positives = 10/11 (90%)

Query: 1 STTINGEKVTL 11  
ST INGEKVTL  
Sbjct: 297 STMINGEKVTL 307

tr Q54414 Phase-1 flagellin (Fragment) [fliC] [Salmonella enterica 503  
Q54414\_SALET subsp. AA  
enterica serovar Marrtens] align

Score = 31.6 bits (67), Expect = 1.8  
Identities = 10/11 (90%), Positives = 10/11 (90%)

Query: 1 STTINGEKVTL 11  
ST INGEKVTL  
Sbjct: 296 STMINGEKVTL 306

Database: EXPASY/UniProtKB  
Posted date: Jul 4, 2005 6:23 AM  
Number of letters in database: 659,769,346  
Number of sequences in database: 2,035,690

Lambda	K	H
0.342	0.283	1.55

Gapped

Lambda	K	H
0.294	0.110	0.610

Matrix: PAM30  
Gap Penalties: Existence: 9, Extension: 1  
Number of HSP's successfully gapped in prelim test: 0  
length of query: 11  
length of database: 659,769,346  
effective HSP length: 2  
effective length of query: 9  
effective length of database: 655,697,966  
effective search space: 5901281694  
effective search space used: 5901281694  
T: 16  
A: 40  
X1: 15 ( 7.4 bits)  
X2: 35 (14.8 bits)  
X3: 58 (24.6 bits)  
S1: 40 (21.6 bits)  
S2: 62 (29.5 bits)

Wallclock time: 2 seconds

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## **Molecular analyses of the Salmonella g. . . flagellar antigen complex [published erratum appears in J Bacteriol 1994 May;176(9):2771]**

**BJ Masten and TM Joys**

Department of Microbiology, School of Medicine, Texas Tech University  
Health Sciences Center, Lubbock 79430.

Salmonella flagellar filaments are polymers of a highly antigenic protein, termed flagellin. Eight main subfactors have been identified in the Salmonella phase-1 g. . . series flagellar antigen. To determine the molecular basis for expression of the epitopes by which the g. . . family subfactors are distinguished, 10 members of this series were selected and their fliC (the structural gene for phase-1 flagellin) genes were sequenced. Comparative analyses of the inferred primary structures of these flagellins did not allow the identification of linear epitopes responsible for the antigen subfactors. This suggests that conformational aspects are involved in determining the antigenic specificity in these cases. A phylogenetic analysis of the flagellin sequences showed that members of the g. . . series do not form a single coherent unit.

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Amino acid sequence for SEF14:

1

MRKSASAVAVLALACGSAHAAGFVGNKAEVQAAVTIAAQNTTSANW  
SQDPGFTGPAVAAGQKVGTLSTATGPHNSVSIAGKGASVSGGVATVP  
FVDGQGQPVFRGRIQGANINDQANTGIDGLAGWRVASSQETLNVPVT  
TFGKSTLPAGTFTATFYVQQYQN

165

Amino acid sequence for the C128 fragment of SEF14:

AAQNTTSANWSQDPGFTGPAVAAGQKVGTLSTATGPHNSVSIAGKGA  
SVSGGVATVPFVDGQGQPVFRGRIQGANINDQANTGIDGLAGWRVASS  
QETLNVPVTTFGKSTLPAGTFTATFYVQQYQN  
(SEQ ID NO:3)

WO 00/78995

PCT/SG99/00061

*pilo puller*  
*similar*  
*similar*  
*similar*

Amino Acid Sequence of *S. enteritidis* Flagellin Antigen

LTQNNLNKSQSSLSSAIERLSSGLRINS AKDDAAGQAIA NRFTS  
NIKGLTQASRNANDGISIAQTTEGALNEINNNLQRVRELSVQATNGTNSDSLKSIQD  
EIQRLEEIDRVSNQTQFNGVKVLSQDNQMKIQVGANDGETITIDLQKIDVKSGLDGD  
FNVNGPKEATVGD LKSSFKNVTGYDTYAAGADKYRVDINSGAVVTDAAAPDKVYVNAA  
NGQLTTDDAENNTAVDLFKTTKSTAGTAEAKAIRGAIKGGKEGDTFDYKGVFTIDTK  
TGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQSSKNVYTSVVNGQFTFDDKT  
KNESAKLSLEANNAVKGESKITVNGAEYTANATGDKITLAGKTMFIDKTASGVSTLI  
NEDAAAAKKSTANPLASIDSALSKVDAVRSSLGAIQNRFD SAITNLGNTVTNLNSARS  
RIEDADYATEVSNMSKAQILQQAGTSVLAQANQVPQNVLSLLR

(SEQ ID NO:4)

90 amino acid fragment of *S. enteritidis* flagellin antigen

TAEAKAIRGAIKGGKEGDTFDYKGVFTIDTKTGDDGNGKVSTTINGEKVTLTVADIA  
TGATDVNAATLQSSKNVYTSVVNGQFTFDDKT

(SEQ ID NO:5)

fragment A: 69 amino acids (aa 258-327 of SEQ ID NO:4)

KEGDTFDYKGVFTIDTKTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQSSKN  
VYTSVVNGQ

(SEQ ID NO:6)

fragment B: 40 amino acids (aa 276-316 of SEQ ID NO:4)

KTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQS

(SEQ ID NO:7)

fragment C: 27 amino acids (aa 279-306 of SEQ ID NO:4)

DGNGKVSTTINGEKVTLTVADIATGAT

(SEQ ID NO:8)

fragment D: 11 amino acids (aa 285-296 of SEQ ID NO:4)

STTINGEKVTL

(SEQ ID NO:9)

*highly conserved*

PTO/PCT Rec'd 06 AUG 2002

形

<110> Kwang, Hwei-Sing  
Liu, Wei  
Low, Su-Shing Sharon  
Loh, Hilda Kwanyeng

<130> 2577-112

<151> 1999-06-22

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<400> 1

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tgcagctcag aatacaacat cagccaactg gagtcaggat cctggcttta cagggcctgc 180

tgttgctgct ggtcagaaag ttggtactct cagcattact gctactggtc cacataactc 240

agtatctatt gcaggtaaag gggcttcggt atctgggtggt gtagccactg tcccgttcgt 300

tgatggacaa ggacagcctg tttccgtgg gcgtattcag ggagccaata ttaatgacca 360

agcaaatact ggaattgacg ggcttgacag ttggcgagtt gccagctctc aagaaacgct 420

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<211> 165

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1 5 10 15

Gly Ser Ala His Ala/Ala Gly Phe Val Gly Asn Lys Ala Glu Val Gln

உயர்நீதிமன்றம், சென்னை.

[illegible]

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<400> 3

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20 25 30

Thr Ala Thr Gly Pro His Asn Ser Val Ser Ile Ala Gly Lys Gly Ala

35

40

45

Ser Val Ser Gly Gly Val Ala Thr Val Pro Phe Val Asp Gly Gln Gly  
50 55 60

Gln Pro Val Phe Arg Gly Arg Ile Gln Gly Ala Asn Ile Asn Asp Gln  
65 70 75 80

Ala Asn Thr Gly Ile Asp Gly Leu Ala Gly Trp Arg Val Ala Ser Ser  
85 90 95

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<210> 4

<211> 493

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<213> Salmonella enteritidis

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20 25 30

Ala Ala Gly Gln Ala Ile Ala Asn Arg Phe Thr Ser Asn Ile Lys Gly  
35 40 45

Leu Thr Gln Ala Ser Arg Asn Ala Asn Asp Gly Ile Ser Ile Ala Gln  
50 55 60

Thr Thr Glu Gly Ala Leu Asn Glu Ile Asn Asn Asn Leu Gln Arg Val  
65 70 75 80

Arg Glu Leu Ser Val Gln Ala Thr Asn Gly Thr Asn Ser Asp Ser Asp  
85 90 95

Leu Lys Ser Ile Gln Asp Glu Ile Gln Gln Arg Leu Glu Glu Ile Asp

L4: Entry 49 of 60

File: USPT

Apr 23, 1996

DOCUMENT-IDENTIFIER: US 5510241 A

TITLE: Method of testing for the presence of Salmonella serotypes expressing Salmonella enteritidis fimbrial antigen (SEFA) and reagents therefore

Detailed Description Text (25):

Electron microscope studies confirmed that MAB 69/25 is directed against an epitope on a fimbrial structure expressed on the bacterial surface that is morphologically distinct from flagellae and the larger type 1 fimbriae. This structure was observed only on Salmonella strains that reacted in direct binding ELISAs and these strains were labelled when examined by immune EM.

[Previous Doc](#)[Next Doc](#)[Go to Doc#](#)

DOCUMENT-IDENTIFIER: US 20020048562 A1

TITLE: TOLEROGENIC FUSION PROTEINS OF IMMUNOGLOBULINS AND METHODS FOR INDUCING AND MAINTAINING TOLERANCE

Detail Description Paragraph:

[0105] To determine whether the 12-26 IgG1 fusion protein can induce B-cell tolerance, the following experiment was conducted. Mouse spleen cells were cultured in vitro in RPMI-1640+5% FCS for 18 hours. The mouse spleen cells were then incubated with increasing concentrations of either free 12-26 peptide, a chemical conjugate of rabbit gamma globulin with 12-26 (RGG-122-26) or with 12-26-IgG1 (Q3). At 18 hours, these spleen cells were washed and then challenged with either lipopolysaccharide (a mitogenic stimulus, not shown) or the A29 fusion protein of Salmonella flagellin that contains the 12-26 peptide. The Salmonella flagellin fusion protein containing the 12-26 epitope has been shown previously to be immunogenic both in vivo and in vitro (data not shown). As a control for induction of tolerance, spleen cells were treated with a rabbit anti-immunoglobulin previously shown to induce unresponsiveness in vitro. G. Warner et al., J. Immunol., 146:2185 (1991). The effect of anti-Ig is shown as an open circle on the right end of each graph. The responsiveness of the cells was measured by ELISA. The results are shown as FIG. 4 (A29 fusion protein with 12-26 peptide challenge).

DOCUMENT-IDENTIFIER: US 20050068040 A1

TITLE: High efficiency electrostatic air sampler

Detail Description Paragraph:

[0055] Yolks from eggs collected immediately before inoculation and at weekly intervals after inoculation were tested for the presence of antibodies specific to *S. enteritidis* flagella by an enzyme-linked immunosorbent assay (ELISA) developed by Holt and Porter (Poultry Science, Volume 72, 2069-1078, 1993) and described previously (Gast et al., Poultry Sciences, Volume 81, 1128-1131, 2002). Post inoculation egg yolk samples were considered to be antibody-positive in this test if their ELISA absorbance values exceeded the mean absorbance value for the preincubation negative control samples by more than two standard deviations.

DOCUMENT-IDENTIFIER: US 20040120962 A1

TITLE: Modulation of immune responses to foreign antigens expressed by recombinant attenuated bacterial vectors

Summary of Invention Paragraph:

[0015] 3. Robertson J. M., G. Grant, E. Allen-Vercoe, M. J. Woodward, A. Pusztai, and H. J. Flint. 2000. Adhesion of *Salmonella enterica* var Enteritidis strains lacking fimbriae and flagella to rat ileal explants cultured at the air interface or submerged in tissue culture medium. *J. Med. Microbiol.* 49:691-696.

Summary of Invention Paragraph:

[0027] 13. Liaudet L., K. G. Murthy, J. G Mabley, P. Pacher, F. G. Soriano, A. L. Salzman, and C. Szabo. 2002. Comparison of inflammation, organ damage, and oxidant stress induced by *Salmonella enterica* serovar Muenchen flagellin and serovar Enteritidis lipopolysaccharides. *Infect. Immun.* 70:192-198.

Summary of Invention Paragraph:

[0029] 15. Parker C. T., and J. Guard-Petter. 2001. Contribution of flagella and invasion protein to pathogenesis of *Salmonella enterica* serovar enteritidis in chicks. *FEMS Microbiol. Lett.* 204:287-291.

Summary of Invention Paragraph:

[0032] 18. Ogushi K., A. Wada, T. Niidome, N. Mori, K. Oishi, T. Nagatake, A. Takahashi, H. Asakura, S. Makino, H. Hojo, Y. Nakahara, M. Ohsaki, T. Hatakeyama, H. Aoyagi, H. Kurazono, J. Moss, and T. Hirayama. 2001. *Salmonella enteritidis* FliC (flagella filament protein) induces human beta-defensin-2 mRNA production by Caco-2 cells. *J. Biol. Chem.* 276:30521-30526.

DOCUMENT-IDENTIFIER: US 20040052802 A1

TITLE: Salmonella vaccine

Detail Description Paragraph:

[0041] Two weeks after challenge, all chickens were necropsied and spleens, cloacal swabs and the caecum contents were cultured for the challenge strain. Direct inoculation on Brilliant Green Agar plates containing naladixic acid (BGA) and plating after enrichment in buffered peptone water containing naladixic acid was performed. Identity of *S. enteritidis* isolates was confirmed by agglutination with flagellum specific antiserum.

DOCUMENT-IDENTIFIER: US 20010021386 A1

TITLE: Salmonella vaccine

Summary of Invention Paragraph:

[0008] When searching for suitable marker antigens, all known Salmonella antigens are to be considered. A known antigen found with all wild type Salmonella species with the exception of some *S. pullorum* and *gallinarum* subspecies is the flagellum. Examples of Salmonella species carrying flagella when in their wild type form are *S. typhimurium*, enteritidis, *choleraesuis*, *dublin*, *typhi*, *abortus-ovi*, *abortus-equi*, *paratyphi A* and *B*, *derby*, *hadar*, *heidelberg*, *agona* and *arizonae*. Flagella are long structures protruding from the cell surface, that play an important role in motility and invasion of certain host cells. Flagella consist of long polymers of the protein called flagellin. It is known that these flagella induce high levels of antibodies. It is also known that the absence of flagella does not significantly impair the viability of the bacterium outside the host: flagella-less mutants of practically all Salmonella species are known and can be grown in vitro. Nevertheless, flagellar proteins of Salmonella have never been contemplated as suitable markers, since they do not or only partially fulfill three of the four marker-requirements:

Summary of Invention Paragraph:

[0017] From a practical point of view, it may however be desirable to delete (part of) the whole flagellin gene from the bacteria to be used in the vaccine, simply by deletion of the gene encoding the flagellar protein. The genes encoding the flagellar proteins of the various Salmonella species are known. They are all very closely related, and therefore highly homologous. Flagellin genes have i.a. been described for *Salmonella enterica* (Li, J. et al., Proc. Natl. Acad. Sci. 91, 2552-2556 (1994)), *Salmonella enteritidis* (Selander, R. K. et al., J. Bacteriol. 174, 3587-3592 (1992)), *Salmonella dublin* (Masten, B. J. and Joys, T. M., J. Bacteriol. 175, 5359-5365 (1993)), *Salmonella typhimurium* (de Vries, N. et al., Appl. Environ. Microbiol. 64, 5033-5038 (1998)), *Salmonella abortus-equi* (Hanafusa, T. et al., Mol. Gen. Genet. 236, 260-266 (1993)). Flagellin genes of novel Salmonella species can easily be found on the basis of their homology with all existing and known Salmonella flagellin genes: standard hybridisation techniques suffice for locating the flagellin gene.

Detail Description Paragraph:

[0057] Vaccines were prepared from a flagellated and a non-flagellated *S. enteritidis* (S.e.) phage type 4 strain. The bacteria were cultured in Tryptose Phosphate Broth, inactivated by the addition of formalin to a final concentration of 0.5%, followed by harvest of the bacterial cells by centrifugation. The cells were resuspended in phosphate buffer saline and formulated into water in oil emulsion vaccines at 5.times.10.sup.9 bacteria/ml. Five chickens were injected intramuscularly with the S.e. fla.sup.+ vaccine and 5 chickens received the S.e. fla.sup.- vaccine. The animals were vaccinated with 0.5 ml vaccine at 14 and 18 weeks of age. At 22 weeks of age, the chickens were bled, and serum was tested in a double antibody sandwich blocking ELISA system specific for antibodies to the g,m flagellin of S.e. (Zijderveld, F. G. van et al. (1993) Vet. Quart. 15, 135-137)



DOCUMENT-IDENTIFIER: US 5750115 A

TITLE: Escherichia coli vaccine

Other Reference Publication (1):

H.T. Campbell et al., "Immunization with Flagella or Anti-Flagella Sera Protects Mice Against Salmonella-enteritidis", Absts. Ann. Meeting Am. Soc. Microbiol. 72: 101, Abst. M131, Apr. 1972.



DOCUMENT-IDENTIFIER: US 5902742 A

TITLE: Complex growth supplement for maintenance of bacterial cell viability and induction of bacterial cell differentiation

Brief Summary Text (6):

For example, rapid and reliable detection of Salmonella serotypes is important for determining the presence of Salmonella in food and animals, such as for example, chickens used for egg production. Standard methods for Salmonella detection are often not sensitive enough to consistently detect the presence of Salmonella serotypes in all instances. Fowl salmonellosis caused by Salmonella enterica var. Gallinarum and Pullorum are diseases of world wide significance in the poultry industry. Since its recognition as an infectious agent nearly 100 years ago, Salmonella enterica var. Pullorum has been classified as a non-motile, aflagellate chicken pathogen (Retter, N.Y. Med. J., Volume 71, 803, 1990; Edwards et al, Identification of Enterobacteriaceae, Burgess Publishing Company, Minneapolis, Minn., 1962). It is particularly capable of contaminating eggs via the reproductive organs of hen (Snoeyenbos, Diseases of Poultry, ninth edition; Ed.: B. W. Calnek; 73-86, 1991). In the United States, S. enterica var. Pullorum was a major problem in the poultry industry earlier this century. The problem decreased following implementation of rigorous serological screening and depopulation of serologically positive flocks. Serological surveillance has been the primary method of keeping S. enterica var. Pullorum in check. However, problems have begun to erupt in a number of United States flocks and indications are that the standard tests for S. enterica var. Pullorum, such as the agglutination assays, are not detecting some infected flocks. Currently, S. enterica var. Enteritidis is the cause of a world-wide increase of salmonellosis in people due to its ability to colonize the reproductive organs of chickens and to contaminate eggs. S. enterica var. Enteritidis has the same lipopolysaccharide (LPS) D1 serotype as S. enterica var. Pullorum, but it is commonly flagellated and produces flagellar H-antigens that are used in a diagnostic scheme to differentiate it from other salmonellae (Edwards, supra). Glycosylated, high-molecular weight (HMW) O-antigen distinguishes virulent strains (Petter, Appl. Env. Microbiol., Volume 59, 2884-2890, 1993; Guard-Petter et al, Appl. Env. Microbiol., Volume 61, 2845-2851, 1995; Guard-Petter et al, Epid. Infec., 1996, In Press; R. Carlson, personal communication). This type of O-antigen structure contributes to the ability of S. enterica var. Enteritidis to hyperflagellate and migrate across a 2% agar surface, but this distinctive phenotype is transient and is lost upon passage and storage (Guard-Petter et al, 1995, supra; Guard-Petter et al, 1996, supra). Hyperflagellation has been described as an outer membrane change that occurs with the differentiation of vegetative bacteria into swarm cells (Allison et al, Molec. Microbiol., Volume 169, 1155-1158, 1994; Allison et al, Infec. Immun., Volume 60, 4740-4746, 1992). A genetic analysis of E. coli and S. enterica var. Typhimurium indicated that swarm cell differentiation could be observed in soft agar (Harshay et al, PNAS, USA, Volume 91, 8631-8635, 1994). A correlation between differentiation and virulence has been described for the urinary tract pathogen Proteus mirabilis (Allison et al, 1994, supra; Allison et al, 1992, supra) where other virulence factors such as toxins and metalloproteases are transcriptionally upregulated at the same time as flagellin. To date, a relationship between virulence and hyperflagellation for S. enterica var. Enteritidis has been made only in those strains that swarm on 2% agar surfaces, because even avirulent rough and semismooth strains of S. enterica var. Enteritidis produce flagella and are motile in soft agar (Guard-Petter et al, 1996, supra). These emerging concepts suggest that at least some aspects of swarm cell differentiation might be involved in the ability of S. enterica var. Enteritidis to contaminate eggs. However, evidence against an association between swarm cell differentiation and egg contamination exists. S. enterica var. Pullorum efficiently contaminates eggs while S. enterica var. Enteritidis does so sporadically (Snoeyenbos, 1991, supra; Shivaprasad et al, Avian Dis., Volume 34, 548-557, 1990; Humphrey et al, Epidemiol. Infect., Volume 106, 489-496, 1991; Keller et al, Infec. Immun., Volume 63, 2442-2449, 1995). Since S. enterica var. Pullorum is historically aflagellate it was considered that either a) the ability to flagellate and undergo swarm cell differentiation was not involved in establishing invasive infections, or b) cellular differentiation of S. enterica var. Pullorum was inhibited.

FIGS. 1A-1K are scanning electron micrographs of *S. enterica* vars. Pullorum and Enteritidis before and after glucose supplementation. FIGS. 1A and 1C are *S. enterica* vars. Pullorum and Enteritidis, respectively, grown without supplementation. FIGS. 1B and 1D are *S. enterica* vars. Pullorum and Enteritidis, respectively, grown with 100 mM glucose on 1.4% HEA media for 40 hours for Pullorum and 16 hours for Enteritidis. FIGS. 1D and 1E show that bundled structures on *S. enterica* var. Enteritidis composed primarily of flagellin are evident. FIG. 1F shows hyphae production by *S. enterica* var. Enteritidis. Hyphae extend beyond the edge of the colony and turn agar opaque. FIG. 1G shows *S. enterica* var. Enteritidis grown with 100 mM Glutamine. FIG. 1H shows *S. enterica* var. Enteritidis grown with 100 mM N-acetylglucosamine. FIG. 1I shows *S. enterica* var. Enteritidis grown with 100 mM proline. FIG. 1J shows *S. enterica* var. Enteritidis grown with 100 mM proline and 100 mM N-acetylglucosamine. FIG. 1K shows *S. enterica* var. Enteritidis grown with 100 mM glutamine and 100 mM N-acetylglucosamine. Scale bar at the upper left corner of FIG. 1A is 1 .mu.m and is the same for FIGS. 1B-1K. FIG. 1E is reduced 33%.

FIGS. 2A-2C are photographs of glucose supplemented *S. enterica* var. *Enteritidis* at different concentrations of glucose supplementation. FIG. 2A shows that using 10 mM glucose produces black colonies (top) and 100 mM glucose produces yellow/orange colonies (bottom; shown as light color colonies in black and white photograph). FIG. 2B shows that using 50 mM glucose produces mixed patterns of black and yellow colonies if air passes over the plate surface. FIG. 2C shows a stable mutant black colony phenotype as identified on screening plates of HEA supplemented with 100 mM maltose after chemical mutagenesis with MNNG. The opaque area between colonies is due to flagella permeating the agar between colonies while agar around mutant remains clear.

FIG. 3 is a photograph of a polyacrylamide gel showing flagellin isotypes as detected in coomassie stained polyacrylamide gels. 60, 54 and 50 kDa from top to bottom are indicated. Molecular weight markers (right most edge) are phosphorylase B (97.4 kDa). Bovine serum albumin (68 kDa) and ovalbumin (43 kDa). Cultures were supplemented as follows from Lane 1 to Lane 6: 10 mM glucose, 100 mM glucose, 200 mM glucose, 10 mM maltose, 100 mM maltose, 200 mM maltose. Cultures for lanes D3 and E3 (200 mM glucose) were not done. (A-C) Pullorum/Gallinarum strain PC CP5-5298E and Pullorum strains 1950 and 1268 (J. deGraft-Hanson and G. Stein, Maryland Department of Agriculture, Animal Health Department, P.O. Box J, Salisbury, Md. 21802); (D) smooth Enteritidis (J. Guard-Petter, Athens, Ga.); (F) Typhimurium LT2 (J. Roth, 201 S. Biology, Univ. Of Utah, Salt Lake City, Utah 84112).

FIGS. 4A and 4B are photographs of a polyacrylamide gel showing H- and O-antigen immunoreactivity of salmonellae flagellin after metabolite supplementation. (FIG. 4A) H-antigen reactive cell surface material. Lanes 1-3: Typhimurium LT2, 100 mM glucose; rough Enteritidis, 10 mM maltose; and Pullorum, 100 mM glucose. Arrows indicate 60, 54 and 50 kDa form top to bottom. (FIG. 4B) D1 O-antigen reactive cell surface material. Lanes 1 and 2, serovar B Typhimurium LT2, 100 mM glucose; Lanes 3 and 4, serovar D1 Enteritidis, 10 mM maltose; Lanes 5 and 6, rough Enteritidis, 100 mM maltose. A(+) indicates samples that were hydrolyzed with bacteriophage P22 endorhamnosidase to specifically remove free O-antigen in order to improve visualization of the 50 kDa flagellin isotype that is cross-reactive with the D1 antiserum (Difco) used as primary antibody.

Scanning electron microscopy (SEM) of Pullorum indicates that cells grown without 100 mM

Detailed Description Text (21):

Detailed Description Text (22):

Detailed Description Text (26):

http://westbrs:9000/bin/cgi-bin/accum\_query.pl?MODE=%20%20%20%20Display%20%20%20... 7/6/05

factors 5, 6 and 7 than were rough and avirulent pt 13A strains. Other D1 serovars not associated with contamination of eggs lacked immunoreactivity with factors 5, 6 and 7, whereas Pullorum immunoreactivity closely resembled that of less virulent strains of Enteritidis. These results indicate that considerable flagellin epitope variation exists even between isogenic variants of a single serovar, whereas other epitopes are conserved between serovars. These findings are in agreement with the *fliC* gene arrangement, where N- and C-terminal regions are highly conserved among enteric organisms and the middle region is highly variable (MacNab, Ann. Rev. Genet., Volume 26, 131-158, 1992; Raha et al, J. Gen. Microbiol., Volume 139, 1401-1407, 1993; Kilger et al, J. Clin. Microbiol., Volume 31, 1108-1110, 1993; all herein incorporated by reference).

#### Detailed Description Text (28):

A molecular basis for the cross-reactivity of H-antigens appears to be an interaction between lipopolysaccharide and flagellin. To investigate this interaction, ammonium sulfate precipitated cell surface material recovered from vortexed cells is immunoblotted using flagellin H-antigen typing antisera G-complex, poly B and poly a-z as primary antisera. Primary antisera is diluted 1:250 in phosphate buffered saline (PBS) and secondary antibody is goat anti-rabbit alkaline phosphate labeled IgG (Pierce) diluted 1:2500. Samples are transferred to nitrocellulose membranes from 10% to 16% polyacrylamide gels prepared according to standard techniques (Laemmli, Nature, Volume 227, 680-685, 1970; Towbin et al PNAS, USA, Volume 76, 4350-4354, 1979, 19; herein incorporated by reference). Typhimurium LT2, Enteritidis, and Pullorum were cultured on HEA at 37.degree. C. for 16 hours (40 hours for Pullorum) supplemented with either 100 mM glucose, 10 mM maltose or 100 mM maltose. Similar results are obtained from all three antisera and show that 1) metabolite supplementation results in detection of an LPS O-antigen ladder for a rough Enteritidis and smooth Pullorum, but not serovar B Typhimurium; 2) metabolite supplementation results in detection of 60 and 50 kDa flagellin isotypes but they often appear as negative or masked bands on immunoblots, and 3) a 54 kDa flagellin band is detectable as a positive band for group B and D1 serovars (FIG. 4A). In addition to H-antigen serotyping, D1 O-antigen antiserum is used for immunoblotting. As expected, an O-antigen ladder was detected for homologous smooth Enteritidis that was not detected for heterologous Typhimurium and rough Enteritidis. However, an unexpected result was that D1 O-antigen detected the 50 kDa flagellin isotype of smooth and rough Enteritidis (FIG. 4B). The rough strain in these studies was isogenic to smooth Enteritidis and had seroconverted to a positive D1 O-antigen slide agglutination reaction when it was supplemented. Thus metabolite supplementation enhances production of smooth LPS which forms an association with flagella that affects the immunoreactivity of both molecules.

Vet Rec. 1996 Feb 17;138(7):149-53.

Related Articles, Links

**Evaluation of SEF14 fimbrial dot blot and flagellar western blot tests as indicators of *Salmonella enteritidis* infection in chickens.**Cooper GL, Thorns CJ.

Veterinary Laboratories Agency, New Haw, Addlestone, Surrey.

7  
Flag?  
Both

The serological responses to *Salmonella enteritidis* flagella (H: g,m) and its fimbrial antigen SEF14 were evaluated as indicators of infection in chickens and to confirm serological results obtained by an ELISA using *S enteritidis* lipopolysaccharide (LPS) (O: 9,12) as the detecting antigen. The SEF14 antigen and flagella were extracted from *S enteritidis* and transferred to nitrocellulose paper for use in Western and dot blot tests. Antisera to 19 salmonella serotypes including *S enteritidis* were raised in rabbits and their cross reactivity to the flagellar and SEF14 antigens was evaluated. Cross reactivity with the SEF14 antigen was found in one antiserum, raised against *S blegdam*, and to flagella in eight of 19 antisera raised against various salmonella serotypes, most of which shared the flagellar factors g or m with *S enteritidis*. The intensity of cross reaction to flagella was strongest in *S derby* and *S blegdam* antisera. Antisera raised in chickens against *S typhimurium* and *S panama* did not cross react in either test, and neither did pooled sera from eight-week-old salmonella-free, broiler breeder parent chickens. Field sera from two commercial flocks with no history of salmonella infection were negative when tested by the LPS ELISA. These sera were also negative when tested by the flagellar and SEF14 blots. *S enteritidis* infection in a commercial laying flock was detected initially when the sera were tested by the LPS ELISA and confirmed in individual and pooled sera by the SEF14 and flagellar tests. *S enteritidis* PT4 was isolated from this flock post mortem.

Flag

PROTEIN SEQUENCE.

PubMed=7960117 [NCBI, ExPASy, EBI, Israel, Japan]

Ogunniyi A.D., Manning P.A., Kotlarski I.;

"A *Salmonella enteritidis* 11RX pilin induces strong T-lymphocyte responses.";

Infect. Immun. 62:5376-5383(1994).

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NCBI BLAST program reference [PMID:9254694]:

Altschul S.F., Madden T.L., Schäffer A.A., Zhang J., Zhang Z., Miller W., Lipman D.J. Gapped BLAST and PSI-BLAST: a new generation of protein database search programs. Nucleic Acids Res. 25:3389-3402(1997).

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Database: EXPASY/UniProtKB

2,035,690 sequences; 659,769,346 total letters

UniProt Knowledgebase Release 5.4 consists of:

UniProtKB/Swiss-Prot Release 47.4 of 05-Jul-2005: 186882 entries

UniProtKB/TrEMBL Release 30.4 of 05-Jul-2005: 1837312 entries

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#### List of potentially matching sequences

Send selected sequences to

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Db	AC	Description	Score	E-value
<input type="checkbox"/>	sp Q06973	FLIC_SALMO Flagellin (Phase-1-C flagellin) [fliC] [Sal...	141	3e-33
<input type="checkbox"/>	sp Q06972	FLIC_SALEN Flagellin (Phase-1-C flagellin) [fliC] [Sal...	141	3e-33
<input type="checkbox"/>	tr Q53WZ9	_SALEN Phase 1 flagellin [fliC] [Salmonella enteritidis]	141	3e-33
<input type="checkbox"/>	tr Q6V2W5	_9ENTR Phase 1 flagellin [fliC] [Salmonella enterica]	141	3e-33
<input type="checkbox"/>	tr Q6V2V9	_9ENTR Phase 1 flagellin [fliC] [Salmonella enterica]	141	3e-33
<input type="checkbox"/>	tr Q66PR7	_SALMO Phase 1 flagellin [fliC] [Salmonella montevideo]	141	3e-33
<input type="checkbox"/>	tr Q6LDG7	_SALGL Phase-1 flagellin [fliC1] [Salmonella gallinarum]	141	3e-33
<input type="checkbox"/>	tr Q6LDG6	_SALET Phase-1 flagellin [fliC1] [Salmonella enterica s...]	141	3e-33
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<input type="checkbox"/>	tr	<u>Q66PN4</u>	_SALET Phase 1 flagellin [fliC] [Salmonella enterica su...	<u>141</u>	3e-33
<input type="checkbox"/>	tr	<u>Q66PN3</u>	_SALET Phase 1 flagellin [fliC] [Salmonella enterica su...	<u>141</u>	3e-33
<input type="checkbox"/>	tr	<u>Q54210</u>	_SALGL Phase-1 flagellin [fliC1] [Salmonella gallinarum]	<u>141</u>	3e-33
<input type="checkbox"/>	tr	<u>Q53998</u>	_SALEN Phase-1 flagellin (Fragment) [fliC] [Salmonella ...]	<u>141</u>	3e-33
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<input type="checkbox"/>	tr	<u>Q54329</u>	_SALET Phase-1 flagellin (Fragment) [fliC] [Salmonella ...]	<u>139</u>	1e-32
<input type="checkbox"/>	tr	<u>Q53989</u>	_SALET Phase-1 flagellin (Fragment) [fliC] [Salmonella ...]	<u>139</u>	1e-32
<input type="checkbox"/>	tr	<u>Q53970</u>	_SALDU Phase-1 flagellin [fliC1] [Salmonella dublin]	<u>139</u>	1e-32
<input type="checkbox"/>	tr	<u>Q53967</u>	_SALET Phase-1 flagellin (Fragment) [fliC] [Salmonella ...]	<u>139</u>	1e-32
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<input type="checkbox"/>	sp	<u>Q52959</u>	FLIC_SALNA Phase-1 flagellin [fliC] [Salmonella naestved]	<u>137</u>	5e-32
<input type="checkbox"/>	sp	<u>Q06971</u>	FLIC_SALDU Flagellin (Phase-1-C flagellin) [fliC] [Sal...	<u>137</u>	5e-32
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<input type="checkbox"/>	tr	<u>Q53583</u>	_SALET Phase-1 flagellin (Fragment) [fliC] [Salmonella ...]	<u>130</u>	6e-30
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<input type="checkbox"/>	tr	<u>Q53991</u>	_9ENTR Phase 1 flagellin [fliC] [Salmonella enterica]	<u>129</u>	1e-29
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<input type="checkbox"/>	tr	<u>Q66PR8</u>	_SALDE Phase 1 flagellin [fliC] [Salmonella derby]	<u>129</u>	1e-29
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<input type="checkbox"/>	sp	<a href="#">Q06969</a>	FLIC_SALBU Flagellin (Phase-1-C flagellin) [fliC] [Sal...	<a href="#">124</a>	4e-28
<input type="checkbox"/>	tr	<a href="#">Q66PR0</a>	_SALBU Phase 1 flagellin [fliC] [Salmonella budapest]	<a href="#">124</a>	4e-28
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<input type="checkbox"/>	tr	<a href="#">Q6V2G8</a>	_9ENTR Phase 1 flagellin [fliC] [Salmonella enterica]	<a href="#">117</a>	4e-26
<input type="checkbox"/>	sp	<a href="#">Q06974</a>	FLIC_SALON Flagellin (Phase-1-C flagellin) [fliC] [Sal...	<a href="#">117</a>	5e-26
<input type="checkbox"/>	tr	<a href="#">Q6V2U1</a>	_9ENTR Phase 1 flagellin [fliC] [Salmonella enterica]	<a href="#">117</a>	5e-26
<input type="checkbox"/>	tr	<a href="#">Q6LD24</a>	_SALET Phase 1 flagellin [fliC] [Salmonella enterica su...	<a href="#">117</a>	5e-26
<input type="checkbox"/>	tr	<a href="#">Q54415</a>	_SALET Phase-1 flagellin (Fragment) [fliC] [Salmonella ...]	<a href="#">117</a>	5e-26
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<input type="checkbox"/>	tr	<a href="#">Q6V2G7</a>	_9ENTR Phase 1 flagellin [fliC] [Salmonella enterica]	<a href="#">116</a>	1e-25
<input type="checkbox"/>	tr	<a href="#">Q6V2U4</a>	_9ENTR Phase 1 flagellin [fliC] [Salmonella enterica]	<a href="#">115</a>	2e-25
<input type="checkbox"/>	tr	<a href="#">Q6V2U3</a>	_9ENTR Phase 1 flagellin [fliC] [Salmonella enterica]	<a href="#">115</a>	2e-25
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<input type="checkbox"/>	tr	<a href="#">Q9R2V0</a>	_SALPU Phase 1 flagellin C (Fragment) [fliC] [Salmonell...	<a href="#">93</a>	1e-18
<input type="checkbox"/>	tr	<a href="#">Q5G1R0</a>	_SALGL FliC (Fragment) [fliC] [Salmonella gallinarum]	<a href="#">89</a>	2e-17
<input type="checkbox"/>	tr	<a href="#">Q5G1Q9</a>	_SALPU FliC (Fragment) [fliC] [Salmonella pullorum]	<a href="#">82</a>	2e-15
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<input type="checkbox"/>	tr	<a href="#">Q8GGH8</a>	_ECOLI Flagellin (Fragment) [fliC] [Escherichia coli]	<a href="#">39</a>	0.025
<input type="checkbox"/>	tr	<a href="#">Q88YG6</a>	_LACPL Cell surface protein [lp_0800] [Lactobacillus pl...	<a href="#">37</a>	0.094
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☐ tr Q76DK5 \_SALET Phase II flagellin [fljB] [Salmonella enterica s... 35 0.36

**Graphical overview of the alignments**

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**Profile hits** 

**Pfam hits** 

Submission	Matches on query sequence		Mat
	1	50	
FLIC_SALMO			
FLIC_SALEH			
Q53M29			
Q6V2M5			
Q6V2V9			
Q66PR7			
Q6LDG7			
Q6LDG6			
Q66PR6			
Q66PN4			
Q66PN3			
Q54210			
Q53998			
Q54864			
Q54863			
Q54329			
Q53989			
Q53970			
Q53967			
Q53822			
Q790B7			
Q6V2M1			
Q57381			
Q6V2U9			
Q53993			
FLIC_SALNA			
FLIC_SALDU			
Q6V2V3			
Q66PR3			
Q6V2V2			
Q66PR5			
FLIC_SALMC			
Q66PR2			
Q6V2V0			
FLIC_SALRO			
Q66PR4			
Q6V2V1			
Q6V2V5			
FLIC_SALBE			
Q6V2H1			
Q53583			
FLIC_SALDE			
Q53991			
Q6V2X1			
Q66PR8			
Q6V2M8			
Q66PS0			
Q66PQ9			
Q66PQ8			
Q53996			
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FLIC_SALSE			
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Q5G1R0			
Q5G1Q9			
Q9R405			
Q9R406			
Q5G1Q8			
Q8GGH0			

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Search  for

Welcome to the SIB BLAST Network Service

If results of this search are reported or published, please mention that the computation was performed at the SIB using the BLAST network service. The SIB BLAST network service uses a server developed at SIB and the NCBI BLAST 2 software.

In case of problems, please read the [online BLAST help](#).  
If your question is not covered, please contact [<helpdesk@expasy.org>](mailto:helpdesk@expasy.org).

NCBI BLAST program reference [PMID:9254694]:

Altschul S.F., Madden T.L., Schäffer A.A., Zhang J., Zhang Z., Miller W., Lipman D.J. Gapped BLAST and PSI-BLAST: a new generation of protein database search programs. Nucleic Acids Res. 25:3389-3402(1997).

Query: 69 AA

Date run: 2005-07-06 11:38:25 UTC+0100 on sib-gml.unil.ch

Program: NCBI BLASTP 1.5.4-Paracel [2003-06-05]

Database: EXPASY/UniProtKB

2,035,690 sequences; 659,769,346 total letters

UniProt Knowledgebase Release 5.4 consists of:

UniProtKB/Swiss-Prot Release 47.4 of 05-Jul-2005: 186882 entries

UniProtKB/TrEMBL Release 30.4 of 05-Jul-2005: 1837312 entries

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#### List of potentially matching sequences

Send selected sequences to

☐ Include query sequence


Db	AC	Description	Score	E-value
<input type="checkbox"/>	sp Q06973	FLIC_SALMO Flagellin (Phase-1-C flagellin) [fliC] [Sal...	161	2e-39
<input type="checkbox"/>	sp Q06972	FLIC_SALEN Flagellin (Phase-1-C flagellin) [fliC] [Sal...	161	2e-39
<input type="checkbox"/>	tr Q53WZ9	_SALEN Phase 1 flagellin [fliC] [Salmonella enteritidis]	161	2e-39
<input type="checkbox"/>	tr Q6V2W5	_9ENTR Phase 1 flagellin [fliC] [Salmonella enterica]	161	2e-39
<input type="checkbox"/>	tr Q6V2V9	_9ENTR Phase 1 flagellin [fliC] [Salmonella enterica]	161	2e-39
<input type="checkbox"/>	tr Q66PR7	_SALMO Phase 1 flagellin [fliC] [Salmonella montevideo]	161	2e-39
<input type="checkbox"/>	tr Q6LDG7	_SALGL Phase-1 flagellin [fliC1] [Salmonella gallinarum]	161	2e-39
<input type="checkbox"/>	tr Q6LDG6	_SALET Phase-1 flagellin [fliC1] [Salmonella enterica s...	161	2e-39
<input type="checkbox"/>	tr Q66PR6	_SALET Phase 1 flagellin [fliC] [Salmonella enterica su...	161	2e-39

<input type="checkbox"/>	tr	<u>Q66PN4</u>	_SALET Phase 1 flagellin [fliC] [Salmonella enterica su...	<u>161</u>	2e-39
<input type="checkbox"/>	tr	<u>Q66PN3</u>	_SALET Phase 1 flagellin [fliC] [Salmonella enterica su...	<u>161</u>	2e-39
<input type="checkbox"/>	tr	<u>Q54210</u>	_SALGL Phase-1 flagellin [fliC1] [Salmonella gallinarum]	<u>161</u>	2e-39
<input type="checkbox"/>	tr	<u>Q53998</u>	_SALEN Phase-1 flagellin (Fragment) [fliC] [Salmonella ...]	<u>161</u>	2e-39
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<input type="checkbox"/>	tr	<u>Q79DB7</u>	_SALET Phase 1 flagellin [fliC] [Salmonella enterica su...	<u>158</u>	2e-38
<input type="checkbox"/>	tr	<u>Q57381</u>	_SALEN Phase-1 flagellin [fliC1] [Salmonella enteritidis]	<u>158</u>	2e-38
<input type="checkbox"/>	tr	<u>Q6V2U9</u>	_9ENTR Phase 1 flagellin [fliC] [Salmonella enterica]	<u>157</u>	2e-38
<input type="checkbox"/>	tr	<u>Q53993</u>	_9ENTR Phase 1 flagellin [fliC] [Salmonella enterica]	<u>157</u>	3e-38
<input type="checkbox"/>	sp	<u>Q52959</u>	FLIC_SALNA Phase-1 flagellin [fliC] [Salmonella naestved]	<u>156</u>	6e-38
<input type="checkbox"/>	sp	<u>Q06971</u>	FLIC_SALDU Flagellin (Phase-1-C flagellin) [fliC] [Sal...	<u>156</u>	6e-38
<input type="checkbox"/>	tr	<u>Q6V2V3</u>	_9ENTR Phase 1 flagellin [fliC] [Salmonella enterica]	<u>156</u>	6e-38
<input type="checkbox"/>	tr	<u>Q66PR3</u>	_SALDU Phase 1 flagellin [fliC] [Salmonella dublin]	<u>156</u>	6e-38
<input type="checkbox"/>	tr	<u>Q6V2V2</u>	_9ENTR Phase 1 flagellin [fliC] [Salmonella enterica]	<u>156</u>	6e-38
<input type="checkbox"/>	tr	<u>Q66PR5</u>	_SALNA Phase 1 flagellin [fliC] [Salmonella naestved]	<u>156</u>	6e-38
<input type="checkbox"/>	sp	<u>Q06981</u>	FLIC_SALMC Flagellin (Phase-1-D flagellin) [fliC] [Sal...	<u>155</u>	1e-37
<input type="checkbox"/>	tr	<u>Q66PR2</u>	_SALMC Phase 1 flagellin [fliC] [Salmonella moscow]	<u>155</u>	1e-37
<input type="checkbox"/>	tr	<u>Q6V2V0</u>	_9ENTR Phase 1 flagellin [fliC] [Salmonella enterica]	<u>155</u>	1e-37
<input type="checkbox"/>	sp	<u>Q06982</u>	FLIC_SALRO Flagellin (Phase-1-C flagellin) [fliC] [Sal...	<u>154</u>	3e-37
<input type="checkbox"/>	tr	<u>Q66PR4</u>	_SALRO Phase 1 flagellin [fliC] [Salmonella rostock]	<u>154</u>	3e-37
<input type="checkbox"/>	tr	<u>Q6V2V1</u>	_9ENTR Phase 1 flagellin [fliC] [Salmonella enterica]	<u>154</u>	3e-37
<input type="checkbox"/>	tr	<u>Q6V2V5</u>	_9ENTR Phase 1 flagellin [fliC] [Salmonella enterica]	<u>153</u>	4e-37
<input type="checkbox"/>	sp	<u>Q06968</u>	FLIC_SALBE Flagellin (Phase-1-I flagellin) [fliC] [Sal...	<u>148</u>	2e-35
<input type="checkbox"/>	tr	<u>Q6V2H1</u>	_9ENTR Phase 1 flagellin [fliC] [Salmonella enterica]	<u>148</u>	2e-35
<input type="checkbox"/>	tr	<u>Q53583</u>	_SALET Phase-1 flagellin (Fragment) [fliC] [Salmonella ...]	<u>148</u>	2e-35
<input type="checkbox"/>	sp	<u>Q06970</u>	FLIC_SALDE Flagellin (Phase-1-C flagellin) [fliC] [Sal...	<u>147</u>	3e-35
<input type="checkbox"/>	tr	<u>Q53991</u>	_9ENTR Phase 1 flagellin [fliC] [Salmonella enterica]	<u>147</u>	3e-35
<input type="checkbox"/>	tr	<u>Q6V2X1</u>	_9ENTR Phase 1 flagellin [fliC] [Salmonella enterica]	<u>147</u>	3e-35
<input type="checkbox"/>	tr	<u>Q66PR8</u>	_SALDE Phase 1 flagellin [fliC] [Salmonella derby]	<u>147</u>	3e-35
<input type="checkbox"/>	tr	<u>Q6V2W8</u>	_9ENTR Phase 1 flagellin [fliC] [Salmonella enterica]	<u>147</u>	3e-35
<input type="checkbox"/>	tr	<u>Q66PS0</u>	_SALET Phase 1 flagellin [fliC] [Salmonella enterica su...	<u>147</u>	3e-35
<input type="checkbox"/>	tr	<u>Q66PQ9</u>	_9ENTR Phase 1 flagellin [fliC] [Salmonella enterica su...	<u>147</u>	3e-35
<input type="checkbox"/>	tr	<u>Q66PQ8</u>	_SALEE Phase 1 flagellin [fliC] [Salmonella enterica VI...	<u>147</u>	3e-35
<input type="checkbox"/>	tr	<u>Q53996</u>	_9ENTR Phase 1 flagellin [fliC] [Salmonella enterica]	<u>147</u>	3e-35
<input type="checkbox"/>	tr	<u>Q6V2G9</u>	_9ENTR Phase 1 flagellin [fliC] [Salmonella enterica]	<u>146</u>	8e-35
<input type="checkbox"/>	tr	<u>Q66PR9</u>	_9ENTR Phase 1 flagellin [fliC] [Salmonella enterica su...	<u>146</u>	8e-35
<input type="checkbox"/>	tr	<u>Q53990</u>	_9ENTR Phase 1 flagellin [fliC] [Salmonella enterica]	<u>146</u>	8e-35
<input type="checkbox"/>	tr	<u>Q53992</u>	_9ENTR Phase 1 flagellin [fliC] [Salmonella enterica]	<u>145</u>	1e-34

<input type="checkbox"/>	tr	<u>Q54489</u>	_SALET Phase 1 flagellin [fliC] [Salmonella enterica su...	<u>144</u>	3e-34
<input type="checkbox"/>	tr	<u>Q6V2U0</u>	_9ENTR Phase 1 flagellin [fliC] [Salmonella enterica]	<u>144</u>	3e-34
<input type="checkbox"/>	tr	<u>Q66PR1</u>	_SALSE Phase 1 flagellin [fliC] [Salmonella senftenberg]	<u>143</u>	6e-34
<input type="checkbox"/>	tr	<u>Q54414</u>	_SALET Phase-1 flagellin (Fragment) [fliC] [Salmonella ...]	<u>142</u>	1e-33
<input type="checkbox"/>	sp	<u>Q06983</u>	FLIC_SALSE Flagellin (Phase-1-C flagellin) [fliC] [Sal...	<u>140</u>	3e-33
<input type="checkbox"/>	sp	<u>Q06969</u>	FLIC_SALBU Flagellin (Phase-1-C flagellin) [fliC] [Sal...	<u>140</u>	3e-33
<input type="checkbox"/>	tr	<u>Q66PR0</u>	_SALBU Phase 1 flagellin [fliC] [Salmonella budapest]	<u>140</u>	3e-33
<input type="checkbox"/>	tr	<u>Q6V2X0</u>	_9ENTR Phase 1 flagellin [fliC] [Salmonella enterica]	<u>140</u>	3e-33
<input type="checkbox"/>	tr	<u>Q6V2U7</u>	_9ENTR Phase 1 flagellin [fliC] [Salmonella enterica]	<u>140</u>	3e-33
<input type="checkbox"/>	tr	<u>Q6V2U6</u>	_9ENTR Phase 1 flagellin [fliC] [Salmonella enterica]	<u>140</u>	3e-33
<input type="checkbox"/>	tr	<u>Q6LD27</u>	_SALET Phase-1 flagellin (Fragment) [fliC] [Salmonella ...]	<u>140</u>	3e-33
<input type="checkbox"/>	tr	<u>Q6V2V7</u>	_9ENTR Phase 1 flagellin [fliC] [Salmonella enterica]	<u>137</u>	3e-32
<input type="checkbox"/>	tr	<u>Q53995</u>	_9ENTR Phase 1 flagellin [fliC] [Salmonella enterica]	<u>135</u>	1e-31
<input type="checkbox"/>	tr	<u>Q53994</u>	_9ENTR Phase 1 flagellin [fliC] [Salmonella enterica]	<u>135</u>	1e-31
<input type="checkbox"/>	tr	<u>Q6V2G8</u>	_9ENTR Phase 1 flagellin [fliC] [Salmonella enterica]	<u>134</u>	3e-31
<input type="checkbox"/>	tr	<u>Q6V2T7</u>	_9ENTR Phase 1 flagellin [fliC] [Salmonella enterica]	<u>133</u>	4e-31
<input type="checkbox"/>	tr	<u>Q6V2G7</u>	_9ENTR Phase 1 flagellin [fliC] [Salmonella enterica]	<u>131</u>	1e-30
<input type="checkbox"/>	sp	<u>Q06974</u>	FLIC_SALON Flagellin (Phase-1-C flagellin) [fliC] [Sal...	<u>131</u>	3e-30
<input type="checkbox"/>	tr	<u>Q6V2U1</u>	_9ENTR Phase 1 flagellin [fliC] [Salmonella enterica]	<u>131</u>	3e-30
<input type="checkbox"/>	tr	<u>Q6LD24</u>	_SALET Phase 1 flagellin [fliC] [Salmonella enterica su...	<u>131</u>	3e-30
<input type="checkbox"/>	tr	<u>Q54415</u>	_SALET Phase-1 flagellin (Fragment) [fliC] [Salmonella ...]	<u>131</u>	3e-30
<input type="checkbox"/>	tr	<u>Q53821</u>	_SALET Phase-1 flagellin (Fragment) [fliC] [Salmonella ...]	<u>131</u>	3e-30
<input type="checkbox"/>	tr	<u>Q6V2U4</u>	_9ENTR Phase 1 flagellin [fliC] [Salmonella enterica]	<u>129</u>	7e-30
<input type="checkbox"/>	tr	<u>Q6V2U3</u>	_9ENTR Phase 1 flagellin [fliC] [Salmonella enterica]	<u>129</u>	9e-30
<input type="checkbox"/>	tr	<u>Q54515</u>	_SALET Phase 1 flagellin [fliC] [Salmonella enterica su...	<u>125</u>	1e-28
<input type="checkbox"/>	tr	<u>Q9R405</u>	_SALGL Phase 1 flagellin C (Fragment) [fliC] [Salmonell...	<u>100</u>	3e-21
<input type="checkbox"/>	tr	<u>Q9R406</u>	_SALPU Phase 1 flagellin C (Fragment) [fliC] [Salmonell...	<u>99</u>	1e-20
<input type="checkbox"/>	tr	<u>Q9R2V0</u>	_SALPU Phase 1 flagellin C (Fragment) [fliC] [Salmonell...	<u>99</u>	1e-20
<input type="checkbox"/>	tr	<u>Q5G1R0</u>	_SALGL FliC (Fragment) [fliC] [Salmonella gallinarum]	<u>88</u>	2e-17
<input type="checkbox"/>	tr	<u>Q5G1Q9</u>	_SALPU FliC (Fragment) [fliC] [Salmonella pullorum]	<u>78</u>	2e-14
<input type="checkbox"/>	tr	<u>Q5G1Q8</u>	_SALGL FliC (Fragment) [fliC] [Salmonella gallinarum]	<u>71</u>	4e-12
<input type="checkbox"/>	tr	<u>Q5ECK7</u>	_ECOLI FliC (Fragment) [fliC] [Escherichia coli]	<u>45</u>	2e-04
<input type="checkbox"/>	tr	<u>Q52R20</u>	_ECOLI FliC (Fragment) [fliC] [Escherichia coli]	<u>45</u>	2e-04
<input type="checkbox"/>	tr	<u>Q842D4</u>	_ECOLI FliC (Fragment) [Escherichia coli]	<u>45</u>	2e-04
<input type="checkbox"/>	tr	<u>Q5ECJ1</u>	_ECOLI FliC (Fragment) [fliC] [Escherichia coli]	<u>45</u>	2e-04
<input type="checkbox"/>	tr	<u>Q5ECI9</u>	_ECOLI FliC (Fragment) [fliC] [Escherichia coli]	<u>45</u>	2e-04
<input type="checkbox"/>	tr	<u>Q9R3Q8</u>	_ECOLI Flagellin (Fragment) [fliC] [Escherichia coli]	<u>45</u>	2e-04
<input type="checkbox"/>	tr	<u>Q8GGI1</u>	_ECOLI Flagellin (Fragment) [fliC] [Escherichia coli]	<u>45</u>	2e-04
<input type="checkbox"/>	tr	<u>Q6VMV6</u>	_ECOLI Flagellin [fliC] [Escherichia coli]	<u>45</u>	2e-04
<input type="checkbox"/>	tr	<u>Q6VMU9</u>	_ECOLI Flagellin [fliC] [Escherichia coli]	<u>45</u>	2e-04
<input type="checkbox"/>	tr	<u>Q5ZPZ4</u>	_ECOLI Flagellin C (Fragment) [fliC] [Escherichia coli]	<u>45</u>	2e-04
<input type="checkbox"/>	tr	<u>Q76DK5</u>	_SALET Phase II flagellin [fljB] [Salmonella enterica s...	<u>45</u>	3e-04
<input type="checkbox"/>	tr	<u>Q6E6Y8</u>	_CITFR Flagellin (Fragment) [fliC] [Citrobacter freundii]	<u>43</u>	0.001
<input type="checkbox"/>	tr	<u>Q8GGH8</u>	_ECOLI Flagellin (Fragment) [fliC] [Escherichia coli]	<u>41</u>	0.003
<input type="checkbox"/>	tr	<u>Q6V2M6</u>	_9ENTR Phase 1 flagellin [fliC] [Salmonella enterica]	<u>39</u>	0.012

☐ tr`Q6V2M5 \_9ENTR Phase 1 flagellin [fliC] [Salmonella enterica] 39 0.012

**Graphical overview of the alignments**

[Click here](#) to resubmit your query after masking regions matching PROSITE profiles  
or Pfam HMMs  
( [Help](#)) (use ScanProsite for more details about PROSITE matches)

**Profile hits** 

**Pfam hits** 

Submission	Matches on query sequence		Mat
	1	50	
FLIC_SALMO			
FLIC_SALEN			
Q534Z9			
Q6V2M5			
Q6V2V9			
Q66PR7			
Q6LDG7			
Q6LDG6			
Q66PR6			
Q66PN4			
Q66PN3			
Q54210			
Q53998			
Q54864			
Q54863			
Q54329			
Q53989			
Q53970			
Q53967			
Q53822			
Q6V2M1			
Q79DB7			
Q57381			
Q6V2U9			
Q53993			
FLIC_SALNA			
FLIC_SALDU			
Q6V2V3			
Q66PR3			
Q6V2V2			
Q66PR5			
FLIC_SALMC			
Q66PR2			
Q6V2V0			
FLIC_SALRO			
Q66PR4			
Q6V2V1			
Q6V2V5			
FLIC_SALBE			
Q6V2H1			
Q53583			
FLIC_SALDE			
Q53991			
Q6V2X1			
Q66PR8			
Q6V2M8			
Q66PS0			
Q66FQ9			
Q66FQ8			
Q53996			
Q6V2G9			
Q66PR9			
Q53990			
Q53992			
Q54489			
Q6V2U0			
Q66PR1			
Q54414			
FLIC_SALSE			
FLIC_SALBU			
Q66PR0			
Q6V2X0			
Q6V2U7			
Q6V2U6			
Q6LD27			
Q6V2V7			
Q53995			
Q53994			
Q6V2G8			
Q6V2T7			
Q6V2G7			
FLIC_SALON			
Q6V2U1			
Q6LD24			
Q54415			
Q53821			
Q6V2U4			
Q6V2U3			
Q54515			
Q9R405			
Q9R406			
Q9R2V0			
Q5G1R0			
Q5G1Q9			
Q5G1Q8			
Q5ECK7			

## Alignments

sp Q06973 Flagellin (Phase-1-C flagellin) [fliC] [Salmonella] 504  
FLIC\_SALMO montevideo] AA  
align

Score = 161 bits (365), Expect = 2e-39  
Identities = 69/69 (100%), Positives = 69/69 (100%)

Query: 1 KEGDTFDYKGVFTTIDTKTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQSSKN 60  
KEGDTFDYKGVFTTIDTKTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQSSKN  
Sbjct: 270 KEGDTFDYKGVFTTIDTKTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQSSKN 329

Query: 61 VYTSVVNGQ 69  
VYTSVVNGQ  
Sbjct: 330 VYTSVVNGQ 338

1V04  
Segment  
Region  
Domain

sp Q06972 Flagellin (Phase-1-C flagellin) [fliC] [Salmonella] 504  
FLIC\_SALEN enteritidis] AA  
align

Score = 161 bits (365), Expect = 2e-39  
Identities = 69/69 (100%), Positives = 69/69 (100%)

Query: 1 KEGDTFDYKGVFTTIDTKTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQSSKN 60  
KEGDTFDYKGVFTTIDTKTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQSSKN  
Sbjct: 270 KEGDTFDYKGVFTTIDTKTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQSSKN 329

Query: 61 VYTSVVNGQ 69  
VYTSVVNGQ  
Sbjct: 330 VYTSVVNGQ 338

tr Q53WZ9 Phase 1 flagellin [fliC] [Salmonella] 505 AA  
Q53WZ9\_SALEN enteritidis] align

Score = 161 bits (365), Expect = 2e-39  
Identities = 69/69 (100%), Positives = 69/69 (100%)

Query: 1 KEGDTFDYKGVFTTIDTKTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQSSKN 60  
KEGDTFDYKGVFTTIDTKTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQSSKN  
Sbjct: 271 KEGDTFDYKGVFTTIDTKTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQSSKN 330

Query: 61 VYTSVVNGQ 69  
VYTSVVNGQ  
Sbjct: 331 VYTSVVNGQ 339

tr Q6V2W5 Phase 1 flagellin [fliC] [Salmonella] 505 AA  
Q6V2W5\_9ENTR enterica] align

Score = 161 bits (365), Expect = 2e-39  
Identities = 69/69 (100%), Positives = 69/69 (100%)

Query: 1 KEGDTFDYKGVTFITIDTKTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQSSKN 60  
KEGDTFDYKGVTFITIDTKTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQSSKN  
Sbjct: 271 KEGDTFDYKGVTFITIDTKTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQSSKN 330

Query: 61 VYTSVVNGQ 69  
VYTSVVNGQ  
Sbjct: 331 VYTSVVNGQ 339

tr Q6V2V9 Phase 1 flagellin [fliC] [Salmonella] 505 AA  
Q6V2V9\_9ENTR enterica align

Score = 161 bits (365), Expect = 2e-39  
Identities = 69/69 (100%), Positives = 69/69 (100%)

Query: 1 KEGDTFDYKGVTFITIDTKTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQSSKN 60  
KEGDTFDYKGVTFITIDTKTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQSSKN  
Sbjct: 271 KEGDTFDYKGVTFITIDTKTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQSSKN 330

Query: 61 VYTSVVNGQ 69  
VYTSVVNGQ  
Sbjct: 331 VYTSVVNGQ 339

tr Q66PR7 Phase 1 flagellin [fliC] [Salmonella] 505 AA  
Q66PR7\_SALMO montevideo align

Score = 161 bits (365), Expect = 2e-39  
Identities = 69/69 (100%), Positives = 69/69 (100%)

Query: 1 KEGDTFDYKGVTFITIDTKTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQSSKN 60  
KEGDTFDYKGVTFITIDTKTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQSSKN  
Sbjct: 271 KEGDTFDYKGVTFITIDTKTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQSSKN 330

Query: 61 VYTSVVNGQ 69  
VYTSVVNGQ  
Sbjct: 331 VYTSVVNGQ 339

tr Q6LDG7 Phase-1 flagellin [fliC1] [Salmonella] 505 AA  
Q6LDG7\_SALGL gallinarum align

Score = 161 bits (365), Expect = 2e-39  
Identities = 69/69 (100%), Positives = 69/69 (100%)

Query: 1 KEGDTFDYKGVTFITIDTKTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQSSKN 60  
KEGDTFDYKGVTFITIDTKTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQSSKN  
Sbjct: 271 KEGDTFDYKGVTFITIDTKTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQSSKN 330

Query: 61 VYTSVVNGQ 69

VYTSVVNGQ

\* Sbjct: 331 VYTSVVNGQ 339

tr Q6LDG6 Phase-1 flagellin [fliC1] [Salmonella enterica subsp. 505  
Q6LDG6\_SALET enterica AA  
serovar Gallinarum/pullorum] align

Score = 161 bits (365), Expect = 2e-39  
Identities = 69/69 (100%), Positives = 69/69 (100%)

Query: 1 KEGDTFDYKGVFTFTIDTKTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQSSKN 60  
KEGDTFDYKGVFTFTIDTKTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQSSKN  
Sbjct: 271 KEGDTFDYKGVFTFTIDTKTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQSSKN 330

Query: 61 VYTSVVNGQ 69  
VYTSVVNGQ  
Sbjct: 331 VYTSVVNGQ 339

tr Q66PR6 Phase 1 flagellin [fliC] [Salmonella enterica subsp. 505  
Q66PR6\_SALET enterica AA  
serovar Enteritidis] align

Score = 161 bits (365), Expect = 2e-39  
Identities = 69/69 (100%), Positives = 69/69 (100%)

Query: 1 KEGDTFDYKGVFTFTIDTKTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQSSKN 60  
KEGDTFDYKGVFTFTIDTKTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQSSKN  
Sbjct: 271 KEGDTFDYKGVFTFTIDTKTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQSSKN 330

Query: 61 VYTSVVNGQ 69  
VYTSVVNGQ  
Sbjct: 331 VYTSVVNGQ 339

tr Q66PN4 Phase 1 flagellin [fliC] [Salmonella enterica subsp. 505  
Q66PN4\_SALET enterica AA  
serovar Emek] align

Score = 161 bits (365), Expect = 2e-39  
Identities = 69/69 (100%), Positives = 69/69 (100%)

Query: 1 KEGDTFDYKGVFTFTIDTKTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQSSKN 60  
KEGDTFDYKGVFTFTIDTKTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQSSKN  
Sbjct: 271 KEGDTFDYKGVFTFTIDTKTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQSSKN 330

Query: 61 VYTSVVNGQ 69  
VYTSVVNGQ  
Sbjct: 331 VYTSVVNGQ 339

tr Q66PN3 Phase 1 flagellin [fliC] [Salmonella enterica subsp. 505  
Q66PN3\_SALET enterica AA  
serovar Enteritidis] align

Score = 161 bits (365), Expect = 2e-39  
Identities = 69/69 (100%), Positives = 69/69 (100%)

Query: 1 KEGDTFDYKGVTFITIDTKTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQSSKN 60  
KEGDTFDYKGVTFITIDTKTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQSSKN  
Sbjct: 271 KEGDTFDYKGVTFITIDTKTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQSSKN 330

Query: 61 VYTSVVNGQ 69  
VYTSVVNGQ  
Sbjct: 331 VYTSVVNGQ 339

tr Q54210 Phase-1 flagellin [fliC1] [Salmonella 494 AA  
Q54210\_SALGL gallinarum] align

Score = 161 bits (365), Expect = 2e-39  
Identities = 69/69 (100%), Positives = 69/69 (100%)

Query: 1 KEGDTFDYKGVTFITIDTKTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQSSKN 60  
KEGDTFDYKGVTFITIDTKTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQSSKN  
Sbjct: 271 KEGDTFDYKGVTFITIDTKTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQSSKN 330

Query: 61 VYTSVVNGQ 69  
VYTSVVNGQ  
Sbjct: 331 VYTSVVNGQ 339

tr Q53998 Phase-1 flagellin (Fragment) [fliC] [Salmonella 493  
Q53998\_SALEN enteritidis] AA  
align

Score = 161 bits (365), Expect = 2e-39  
Identities = 69/69 (100%), Positives = 69/69 (100%)

Query: 1 KEGDTFDYKGVTFITIDTKTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQSSKN 60  
KEGDTFDYKGVTFITIDTKTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQSSKN  
Sbjct: 259 KEGDTFDYKGVTFITIDTKTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQSSKN 318

Query: 61 VYTSVVNGQ 69  
VYTSVVNGQ  
Sbjct: 319 VYTSVVNGQ 327

tr Q54864 Phase-1 flagellin [fliC] [Salmonella 505 AA  
Q54864\_SALPU pullorum] align

Score = 159 bits (360), Expect = 1e-38  
Identities = 68/69 (98%), Positives = 69/69 (99%)

Query: 1 KEGDTFDYKGVTFITIDTKTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQSSKN 60  
KEGDTFDYKGVTFITIDTKTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQSSKN  
Sbjct: 271 KEGDTFDYKGVTFITIDTKTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQSSKN 330

Query: 61 VYTSVVNGQ 69  
VYTSVVNG+  
Sbjct: 331 VYTSVVNGK 339

tr Q54863 Phase-1 flagellin [fliC] [Salmonella 505 AA  
Q54863\_SALPU pullorum] align

Score = 159 bits (360), Expect = 1e-38  
Identities = 68/69 (98%), Positives = 69/69 (99%)

Query: 1 KEGDTFDYKGVTFITIDTKTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQSSKN 60  
KEGDTFDYKGVTFITIDTKTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQSSKN  
Sbjct: 271 KEGDTFDYKGVTFITIDTKTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQSSKN 330

Query: 61 VYTSVVNGQ 69  
VYTSVVNG+  
Sbjct: 331 VYTSVVNGK 339

tr Q54329 Phase-1 flagellin (Fragment) [fliC] [Salmonella enterica 504  
Q54329\_SALET subsp. AA  
enterica serovar Enteritidis var. jena] align

Score = 159 bits (360), Expect = 1e-38  
Identities = 68/69 (98%), Positives = 69/69 (99%)

Query: 1 KEGDTFDYKGVTFITIDTKTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQSSKN 60  
KEGDTFDYKGVTFITIDTKTG+DGNGKVSTTINGEKVTLTVADIATGATDVNAATLQSSKN  
Sbjct: 270 KEGDTFDYKGVTFITIDTKTGNDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQSSKN 329

Query: 61 VYTSVVNGQ 69  
VYTSVVNGQ  
Sbjct: 330 VYTSVVNGQ 338

tr Q53989 Phase-1 flagellin (Fragment) [fliC] [Salmonella enterica 504  
Q53989\_SALET subsp. AA  
enterica serovar Essen] align

Score = 159 bits (360), Expect = 1e-38  
Identities = 68/69 (98%), Positives = 69/69 (99%)

Query: 1 KEGDTFDYKGVTFITIDTKTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQSSKN 60  
KEGDTFDYKGVTFITIDTKTG+DGNGKVSTTINGEKVTLTVADIATGATDVNAATLQSSKN  
Sbjct: 270 KEGDTFDYKGVTFITIDTKTGNDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQSSKN 329

Query: 61 VYTSVVNGQ 69  
VYTSVVNGQ

Sbjct: 330 VYTSVVNGQ 338

tr Q53970 Phase-1 flagellin [fliC] [Salmonella 505 AA  
Q53970\_SALDU dublin] align

Score = 159 bits (360), Expect = 1e-38  
Identities = 68/69 (98%), Positives = 68/69 (98%)

Query: 1 KEGDTFDYKGVTFITIDTKTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQSSKN 60  
KEGDTFDYKGVTFITIDTKTGDDGNGKVSTTINGEKVTLTVADIATGA DVNAATLQSSKN  
Sbjct: 271 KEGDTFDYKGVTFITIDTKTGDDGNGKVSTTINGEKVTLTVADIATGAADVNAATLQSSKN 330

Query: 61 VYTSVVNGQ 69  
VYTSVVNGQ  
Sbjct: 331 VYTSVVNGQ 339

tr Q53967 Phase-1 flagellin (Fragment) [fliC] [Salmonella enterica 465  
Q53967\_SALET subsp. AA  
enterica serovar Enteritidis var. danyasz] align

Score = 159 bits (360), Expect = 1e-38  
Identities = 68/69 (98%), Positives = 69/69 (99%)

Query: 1 KEGDTFDYKGVTFITIDTKTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQSSKN 60  
KEGDTFDYKGVTFITIDTKTG+DGNGKVSTTINGEKVTLTVADIATGATDVNAATLQSSKN  
Sbjct: 270 KEGDTFDYKGVTFITIDTKTGNDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQSSKN 329

Query: 61 VYTSVVNGQ 69  
VYTSVVNGQ  
Sbjct: 330 VYTSVVNGQ 338

tr Q53822 Phase-1 flagellin (Fragment) [fliC] [Salmonella enterica 504  
Q53822\_SALET subsp. AA  
enterica serovar Enteritidis var. chaco] align

Score = 159 bits (360), Expect = 1e-38  
Identities = 68/69 (98%), Positives = 69/69 (99%)

Query: 1 KEGDTFDYKGVTFITIDTKTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQSSKN 60  
KEGDTFDYKGVTFITIDTKTG+DGNGKVSTTINGEKVTLTVADIATGATDVNAATLQSSKN  
Sbjct: 270 KEGDTFDYKGVTFITIDTKTGNDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQSSKN 329

Query: 61 VYTSVVNGQ 69  
VYTSVVNGQ  
sbjct: 330 VYTSVVNGQ 338

tr Q6V2W1 Phase 1 flagellin [fliC] [Salmonella 505 AA

Q6V2W1\_9ENTR

enterica]

align

Score = 158 bits (359), Expect = 1e-38

Identities = 68/69 (98%), Positives = 68/69 (98%)

Query: 1 KEGDTFDYKGVTFITIDTKTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQSSKN 60  
KEGDTFDYKGVTFITIDTKTGDDGNGKVSTTINGEKVTLTVADIA GATDVNAATLQSSKN  
Sbjct: 271 KEGDTFDYKGVTFITIDTKTGDDGNGKVSTTINGEKVTLTVADIAIGATDVNAATLQSSKN 330

Query: 61 VYTSVVGQ 69

VYTSVVGQ

Sbjct: 331 VYTSVVGQ 339

tr Q79DB7

Phase 1 flagellin [fliC] [Salmonella enterica subsp.

505

Q79DB7\_SALET enterica

AA

serovar Othmarschen]

align

Score = 158 bits (358), Expect = 2e-38

Identities = 68/69 (98%), Positives = 68/69 (98%)

Query: 1 KEGDTFDYKGVTFITIDTKTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQSSKN 60  
KEGDTFDYKGVTFITIDTKTGDDGNGKVSTTINGEKVTLTVADIAT ATDVNAATLQSSKN  
Sbjct: 271 KEGDTFDYKGVTFITIDTKTGDDGNGKVSTTINGEKVTLTVADIATSATDVNAATLQSSKN 330

Query: 61 VYTSVVGQ 69

VYTSVVGQ

Sbjct: 331 VYTSVVGQ 339

tr Q57381

Phase-1 flagellin [fliC] [Salmonella

505 AA

Q57381\_SALEN

enteritidis]

align

Score = 158 bits (358), Expect = 2e-38

Identities = 68/69 (98%), Positives = 68/69 (98%)

Query: 1 KEGDTFDYKGVTFITIDTKTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQSSKN 60  
KEGDTFDYKGVTFITIDTKTGDDGNGKVSTTINGEKVTLTVADIAT ATDVNAATLQSSKN  
Sbjct: 271 KEGDTFDYKGVTFITIDTKTGDDGNGKVSTTINGEKVTLTVADIATSATDVNAATLQSSKN 330

Query: 61 VYTSVVGQ 69

VYTSVVGQ

Sbjct: 331 VYTSVVGQ 339

tr Q6V2U9

Phase 1 flagellin [fliC] [Salmonella

505 AA

Q6V2U9\_9ENTR

enterica]

align

Score = 157 bits (357), Expect = 2e-38

Identities = 68/69 (98%), Positives = 68/69 (98%)

Query: 1 KEGDTFDYKGVTFITIDTKTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQSSKN 60  
KEGDTFDYKGVTFITIDTKTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQSSKN

Sbjct: 271 KEGDTFDYKGVFTFTIDTKTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQSSKN 330

Query: 61 VYTSVVNGQ 69  
VYTSVVNGQ

Sbjct: 331 VYTSVVNGQ 339

tr Q53993 Phase 1 flagellin [fliC] [Salmonella] 508 AA  
Q53993\_9ENTR enterica] align

Score = 157 bits (356), Expect = 3e-38  
Identities = 67/69 (97%), Positives = 68/69 (98%)

Query: 1 KEGDTFDYKGVFTFTIDTKTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQSSKN 60  
KEGDTFDYKGV+FTFTIDTKTGDDGNGKVSTTINGEKVTLTVADI TGATDVNAATLQSSKN  
Sbjct: 274 KEGDTFDYKGVSTFTIDTKTGDDGNGKVSTTINGEKVTLTVADITTGATDVNAATLQSSKN 333

Query: 61 VYTSVVNGQ 69  
VYTSVVNGQ  
Sbjct: 334 VYTSVVNGQ 342

sp Q52959 Phase-1 flagellin [fliC] [Salmonella] 504 AA  
FLIC\_SALNA naestved] align

Score = 156 bits (354), Expect = 6e-38  
Identities = 67/69 (97%), Positives = 67/69 (97%)

Query: 1 KEGDTFDYKGVFTFTIDTKTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQSSKN 60  
KEGDTFDYKGVFTFTIDTKTGDDGNGKVSTTINGEKVTLTVADIA GA DVNAATLQSSKN  
Sbjct: 270 KEGDTFDYKGVFTFTIDTKTGDDGNGKVSTTINGEKVTLTVADIAIGAADVNAATLQSSKN 329

Query: 61 VYTSVVNGQ 69  
VYTSVVNGQ  
Sbjct: 330 VYTSVVNGQ 338

sp Q06971 Flagellin (Phase-1-C flagellin) [fliC] [Salmonella dublin] 504 AA  
FLIC\_SALDU align

Score = 156 bits (354), Expect = 6e-38  
Identities = 67/69 (97%), Positives = 67/69 (97%)

Query: 1 KEGDTFDYKGVFTFTIDTKTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQSSKN 60  
KEGDTFDYKGVFTFTIDTKTGDDGNGKVSTTINGEKVTLTVADIA GA DVNAATLQSSKN  
Sbjct: 270 KEGDTFDYKGVFTFTIDTKTGDDGNGKVSTTINGEKVTLTVADIAIGAADVNAATLQSSKN 329

Query: 61 VYTSVVNGQ 69  
VYTSVVNGQ  
Sbjct: 330 VYTSVVNGQ 338

tr Q6V2V3 Phase 1 flagellin [fliC] [Salmonella] 505 AA  
Q6V2V3\_9ENTR enterica align

Score = 156 bits (354), Expect = 6e-38  
Identities = 67/69 (97%), Positives = 67/69 (97%)

Query: 1 KEGDTFDYKGVFTFTIDTKTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQSSKN 60  
KEGDTFDYKGVFTFTIDTKTGDDGNGKVSTTINGEKVTLTVADIA GA DVNAATLQSSKN  
Sbjct: 271 KEGDTFDYKGVFTFTIDTKTGDDGNGKVSTTINGEKVTLTVADIAIGAADVNAATLQSSKN 330

Query: 61 VYTSVVNGQ 69  
VYTSVVNGQ  
Sbjct: 331 VYTSVVNGQ 339

tr Q66PR3 Phase 1 flagellin [fliC] [Salmonella] 505 AA  
Q66PR3\_SALDU dublin align

Score = 156 bits (354), Expect = 6e-38  
Identities = 67/69 (97%), Positives = 67/69 (97%)

Query: 1 KEGDTFDYKGVFTFTIDTKTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQSSKN 60  
KEGDTFDYKGVFTFTIDTKTGDDGNGKVSTTINGEKVTLTVADIA GA DVNAATLQSSKN  
Sbjct: 271 KEGDTFDYKGVFTFTIDTKTGDDGNGKVSTTINGEKVTLTVADIAIGAADVNAATLQSSKN 330

Query: 61 VYTSVVNGQ 69  
VYTSVVNGQ  
Sbjct: 331 VYTSVVNGQ 339

tr Q6V2V2 Phase 1 flagellin [fliC] [Salmonella] 505 AA  
Q6V2V2\_9ENTR enterica align

Score = 156 bits (354), Expect = 6e-38  
Identities = 67/69 (97%), Positives = 67/69 (97%)

Query: 1 KEGDTFDYKGVFTFTIDTKTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQSSKN 60  
KEGDTFDYKGVFTFTIDTKTGDDGNGKVSTTINGEKVTLTVADIA GA DVNAATLQSSKN  
Sbjct: 271 KEGDTFDYKGVFTFTIDTKTGDDGNGKVSTTINGEKVTLTVADIAIGAADVNAATLQSSKN 330

Query: 61 VYTSVVNGQ 69  
VYTSVVNGQ  
Sbjct: 331 VYTSVVNGQ 339

tr Q66PR5 Phase 1 flagellin [fliC] [Salmonella] 505 AA  
Q66PR5\_SALNA naestved align

Score = 156 bits (354), Expect = 6e-38  
Identities = 67/69 (97%), Positives = 67/69 (97%)

Query: 1 KEGDTFDYKGVFTFTIDTKTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQSSKN 60  
KEGDTFDYKGVFTFTIDTKTGDDGNGKVSTTINGEKVTLTVADIA GA DVNAATLQSSKN

Sbjct: 271 KEGDTFDYKGVTFITIDTKTGDDGNGKVSTTINGEKVTLTVADIAIGAADVNAATLQSSKN 330

Query: 61 VYTSVVNGQ 69

VYTSVVNGQ

Sbjct: 331 VYTSVVNGQ 339

sp Q06981 **Flagellin (Phase-1-D flagellin) [fliC] [Salmonella moscow]** 504 AA  
FLIC\_SALMC

align

Score = 155 bits (352), Expect = 1e-37

Identities = 67/69 (97%), Positives = 68/69 (98%)

Query: 1 KEGDTFDYKGVTFITIDTKTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQSSKN 60

KEGDTFDYKGVTFITIDTKTGDDGNGKVSTTINGEKVTLTVADIATGAT+VNAATLQSSKN

Sbjct: 270 KEGDTFDYKGVTFITIDTKTGDDGNGKVSTTINGEKVTLTVADIATGATNVNAATLQSSKN 329

Query: 61 VYTSVVNGQ 69

VYTSVVNGQ

Sbjct: 330 VYTSVVNGQ 338

tr Q66PR2 **Phase 1 flagellin [fliC] [Salmonella** 505 AA  
Q66PR2\_SALMC **moscow]** align

Score = 155 bits (352), Expect = 1e-37

Identities = 67/69 (97%), Positives = 68/69 (98%)

Query: 1 KEGDTFDYKGVTFITIDTKTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQSSKN 60

KEGDTFDYKGVTFITIDTKTGDDGNGKVSTTINGEKVTLTVADIATGAT+VNAATLQSSKN

Sbjct: 271 KEGDTFDYKGVTFITIDTKTGDDGNGKVSTTINGEKVTLTVADIATGATNVNAATLQSSKN 330

Query: 61 VYTSVVNGQ 69

VYTSVVNGQ

Sbjct: 331 VYTSVVNGQ 339

tr Q6V2V0 **Phase 1 flagellin [fliC] [Salmonella** 505 AA  
Q6V2V0\_9ENTR **enterica]** align

Score = 155 bits (352), Expect = 1e-37

Identities = 67/69 (97%), Positives = 68/69 (98%)

Query: 1 KEGDTFDYKGVTFITIDTKTGDDGNGKVSTTINGEKVTLTVADIATGATDVNAATLQSSKN 60

KEGDTFDYKGVTFITIDTKTGDDGNGKVSTTINGEKVTLTVADIATGAT+VNAATLQSSKN

Sbjct: 271 KEGDTFDYKGVTFITIDTKTGDDGNGKVSTTINGEKVTLTVADIATGATNVNAATLQSSKN 330

Query: 61 VYTSVVNGQ 69

VYTSVVNGQ

Sbjct: 331 VYTSVVNGQ 339

TITLE: Method of testing for the presence of Salmonella serotypes expressing Salmonella enteritidis fimbrial antigen (SEFA) and reagents therefore

Transmission electron microscopy of *S. enteritidis* 1246/89 (fusion strain) cultured for 18 hours at 37.degree. C. revealed three identifiable types of surface organelles. The majority of organisms expressed flagellae, as well as a 'rigid', straight type 1 fimbriae measuring up to 300 nm in length and 8 nm in diameter, projecting from the cell surface. The number of fimbriae on each bacterial cell was variable, and some organisms were devoid of any. A fine fibrillar material attached, usually uniformly, around the bacterium was also observed. Individual filaments within this material were difficult to visualise, measuring less than 5 nm in diameter. Filaments had a 'kinked' conformation such that they entangled with each other to form a matted appearance. The matted fibrils extended from the cell surface to approximately 200 nm within the limit of the pool of negative stain around each cell. When the same strain of *S. enteritidis* was incubated with MAB 69/25 and immunogold conjugate, the fimbrial material was labelled heavily with gold particles. Once labelled this antigen could be seen to extend up to 0.1 micrometers from the cell surface, and was also found in detached amorphous clumps.

Flagellae and type 1 fimbriae were unlabelled. Two further *S. enteritidis* strains and three *S. dublin* strains that reacted in the direct binding ELISA, also expressed this fimbrial material which was specifically labelled with the MAB, although many *S. dublin* organisms appeared within a population not to express this structure or epitope. Fimbrial antigen was not detected or labelled when the same strains of *S. enteritidis* and *S. dublin* were grown at 22.degree. C. Strains of *S. gallinarum*, *S. pullorum* and *S. typhimurium* grown at 37.degree. C. for 24 hr were not labelled with gold after probing with Mab.

FIGS. 1A and 1B are *S. enteritidis* negatively stained with PTA showing three distinct surface organelles. 1A; fine fimbrial material radiating from cell surface and a detached flagellum (arrow). Bar, 200 nm. 1B; fimbrial material (fa) forming matted appearance, and type 1 fimbriae (arrows). Bar 200 nm.

FIGS. 2A and 2B are *S. enteritidis* organisms probed with Mab 69/25 and labelled with immunogold. 1A; specific labelling of matted fimbrial antigen (fa) uniformly covering the cell surface. Bar, 600 nm. 2B; gold particles attached to matted fimbrial antigen (fa), but flagella and type 1 fimbriae (arrows) are unlabelled. Bar, 400 nm.